

TM 11-5805-391-15

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT,
AND DEPOT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS

CENTRAL OFFICE, TELEPHONE, MANUAL
AN/TTC-23

AND AN/TTC-23A (NSN 5805-00-937-3179)

This copy is a reprint which includes current
pages from Changes 1 through 6.

HEADQUARTERS, DEPARTMENT OF THE ARMY
MARCH 1969

WARNING

HIGH VOLTAGE

is used in this equipment

DEATH ON CONTACT

MAY RESULT IF SAFETY PRECAUTIONS ARE

NOT OBSERVED

Maintenance adjustments of this equipment are made with power applied. Be careful when working near the interior of the equipment or near the ac power distribution.

WARNING

VENTILATION IS ESSENTIAL

To prevent asphyxiation, ventilate the AN/TTC-23 at all times when occupied.

CHANGE
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 16 June 1981

**Operator's, Organizational, Direct Support, General Support
and Depot Maintenance Manual
Including Repair Parts and Special Tools Lists
Central Office, Telephone, Manual
AN/TTC-23 (NSN 5805-00-937-3179)
AND
AN/TTC-23A (NSN 5805-01-030-4121)**

TM 11-5805-391-15, 6 March 1969, is changed as follows:

1. The title is changed as indicated above.
2. New or changed illustrations are indicated by a vertical bar in front of the figure caption.
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4. Remove old pages and insert new pages as indicated below:

Remove

i, ii, and iii
1-1 through 1-4
4-1 and 4-2
4-5 and 4-6
4-15 through 4-18
A-1 through A-3
C-3, C-4, and C-5
None

Insert

i, ii, and iii
1-1 through 1-4
4-1 and 4-2
4-5 and 4-6
4-15 through 4-18
A-1 and A-2
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5. File this change sheet in front of the publication for reference purposes.

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 6 March 1969

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AND DEPOT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS

CENTRAL OFFICE, TELEPHONE, MANUAL

AN/TTC-23 (NSN 5805-00-937-3179)

AND

AN/TTC-23A (NSN 5805-01-030-4121)

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INTERVIEW WITH THE AUTHOR

Q: You have written a book on the history of the Chinese in Canada. Could you tell us a bit about the book and your research process?

A: The book, titled "The Chinese in Canada: A History", is a comprehensive study of the Chinese diaspora in Canada. It covers the history of Chinese immigration to Canada from the mid-19th century to the present day. The research process involved extensive archival work, interviews with Chinese Canadians, and a review of historical documents and literature. The book aims to provide a balanced and accurate account of the Chinese experience in Canada, highlighting both the challenges and the contributions of the Chinese diaspora to Canadian society.

Q: What are some of the key themes or findings in the book?

A: Some of the key themes in the book include the historical context of Chinese immigration to Canada, the challenges faced by Chinese immigrants, the impact of Chinese culture on Canadian society, and the ongoing contributions of Chinese Canadians to Canadian society. The book also explores the historical and contemporary issues facing the Chinese diaspora, such as discrimination, racism, and the search for identity.

Q: How has the Chinese diaspora in Canada changed over time?

A: The Chinese diaspora in Canada has undergone significant changes over time. In the early days of immigration, Chinese immigrants were primarily men who came to Canada to work in the gold and silver mines. Over time, the Chinese diaspora in Canada has become more diverse, with women and families immigrating to Canada. Today, Chinese Canadians are a significant part of Canadian society, contributing to the economy, culture, and politics of Canada. The Chinese diaspora in Canada has also become more integrated into Canadian society, with many Chinese Canadians holding high-ranking positions in various fields.

Q: What are some of the challenges faced by Chinese Canadians today?

A: Chinese Canadians face a range of challenges today, including discrimination, racism, and the search for identity. Many Chinese Canadians feel that they are not fully accepted into Canadian society, and this can lead to feelings of isolation and exclusion. There are also challenges related to language and culture, as many Chinese Canadians are not fluent in English or French, and may feel that they are not fully understood by their Canadian peers. The Chinese diaspora in Canada also faces challenges related to the economy, as many Chinese Canadians are employed in low-wage, high-risk jobs.

Q: What are some of the contributions of Chinese Canadians to Canadian society?

A: Chinese Canadians have made significant contributions to Canadian society in a variety of fields. They have played a key role in the development of the Canadian economy, particularly in the mining and construction industries. They have also made significant contributions to Canadian culture, through their art, music, and literature. Chinese Canadians have also played a key role in the development of Canadian politics, with many Chinese Canadians holding high-ranking positions in the Canadian government and political parties. The Chinese diaspora in Canada has also contributed to the development of Canadian society through their work in education, healthcare, and other social services.

CHAPTER 1

INTRODUCTION

Section 1—GENERAL

1-1. Scope

a. This manual describes Central Office, Telephone, Manua AN/TTC-23 and AN/TTC-23A (fig. 1-1 and 1-2). The manual includes instructions for installing, operating, and maintaining the AN/TTC-23 and AN/TTC-23A.

b. Throughout the manual, where applicable, references are made to other publications that cover the installation, operation, and maintenance of the installed equipment.

c. Appendix B is current as of March 1973. Appendix D is current as of 15 May 1977.

d. Throughout this manual, reference to AN/TTC-23 means the data is common to both configurations. Specific differences will be stated when applicable.

1-2. Index of Technical Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a. *Reports of Maintenance and Unsatisfactory Equipment.* Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

b. *Report of Item and Packaging Discrepancies.* Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAV-MATINST 4355.73/AFR 400-54/MCO 4430.3E.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C /DLAR 4500.15.

1-3.1 Reporting Errors And Recommending Improvements

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703.

1-3.2. Reporting Equipment Improvement Recommendations (EIR)

If your AN/TTC-23 or AN/TTC-23A needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

1-3.3 Administrative Storage

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraph 6-4.

1-3.4 Differences Between Models

In the AN/TTC-23A, Converter, Telephone Signal CV-1548/G and Telephone Circuit, Trunk Relay TA-276/TTC have been removed. One additional Telephone Circuit, Line Relay TA-452/GTA-14(V) is installed in the rack in the space vacated by the TA-276/TTC. This increased the number of subscriber lines, and removed the trunk lines and plug supervision. The facilities available in each configuration are listed in paragraph 1-5b.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

NOTE

The AN/TTC-23 is a 100 line/trunk and 12 plug supervision trunk manual telephone central office. Compatibility of the AN/TTC-23 with other dissimilar switching equipments (example: AN/MTC-1 and AN/MTC-9) is restricted to the 100 line trunks. The 12 plug supervision trunks are only compatible with other AN/TTC-23 switches.

a. The use of Converter, Telephone, Signal CV-1548/G to accomplish two-way supervision is unique in this application since it requires replacement of the 18A3 plug-in panels with 18A4 plug-in panels and will

only be compatible with other switch configurations utilizing the Telephone Trunk Relay Case TA-276/TTC and similarly equipped Telephone Signal Converters CV-1548/G (at present only the AN/TTC-23).

b. Central Office, Telephone, Manual AN/TTC-23 is an air- or vehicular-transportable manual telephone switching facility. The AN/TTC-23 contains components of Central Office, Telephone, Manual AN/GTA-14(V) (TM 11-2146) which provide termination for local or common-battery subscriber circuits and manual or dial trunk circuits. Components of the AN/TTC-23 are housed in a Modified Shelter, Electrical Equipment S-280-B/G. The AN/TTC-23 is used at signal centers in area-type communication systems.

1-5. Technical Characteristics

a. Power Requirements.

Type	115 volts ac, 60 Hz, 3-wire single phase.
Consumption:	
Lights	700 watts.
Exhaust blower	300 watts.
Electric heaters (2)	3,000 watts.
Air conditioner	480 watts.
Intercommunication Station LS-147C/FI	36 watts.
Battery exhaust fan	10 watts.
Power Distribution Panel SB-1399/TTC	600 watts.
Total	5,126 watts.

b. Switching Characteristics.

Local or common-battery subscriber circuits	AN/TTC-23	AN/TTC-23A
Information circuits	98.	120
Two-way plug supervision trunks	2.	2
Spare subscriber lines	12.	0
	0.	24

c. Intra-Area Communications Facilities.

Telephone circuits	1.
Intercommunication circuit	1.

d. Protection.

Lines and trunks	Lightning arrestors.
Power circuits	Fuses and circuit breakers.

e. Physical Characteristics.

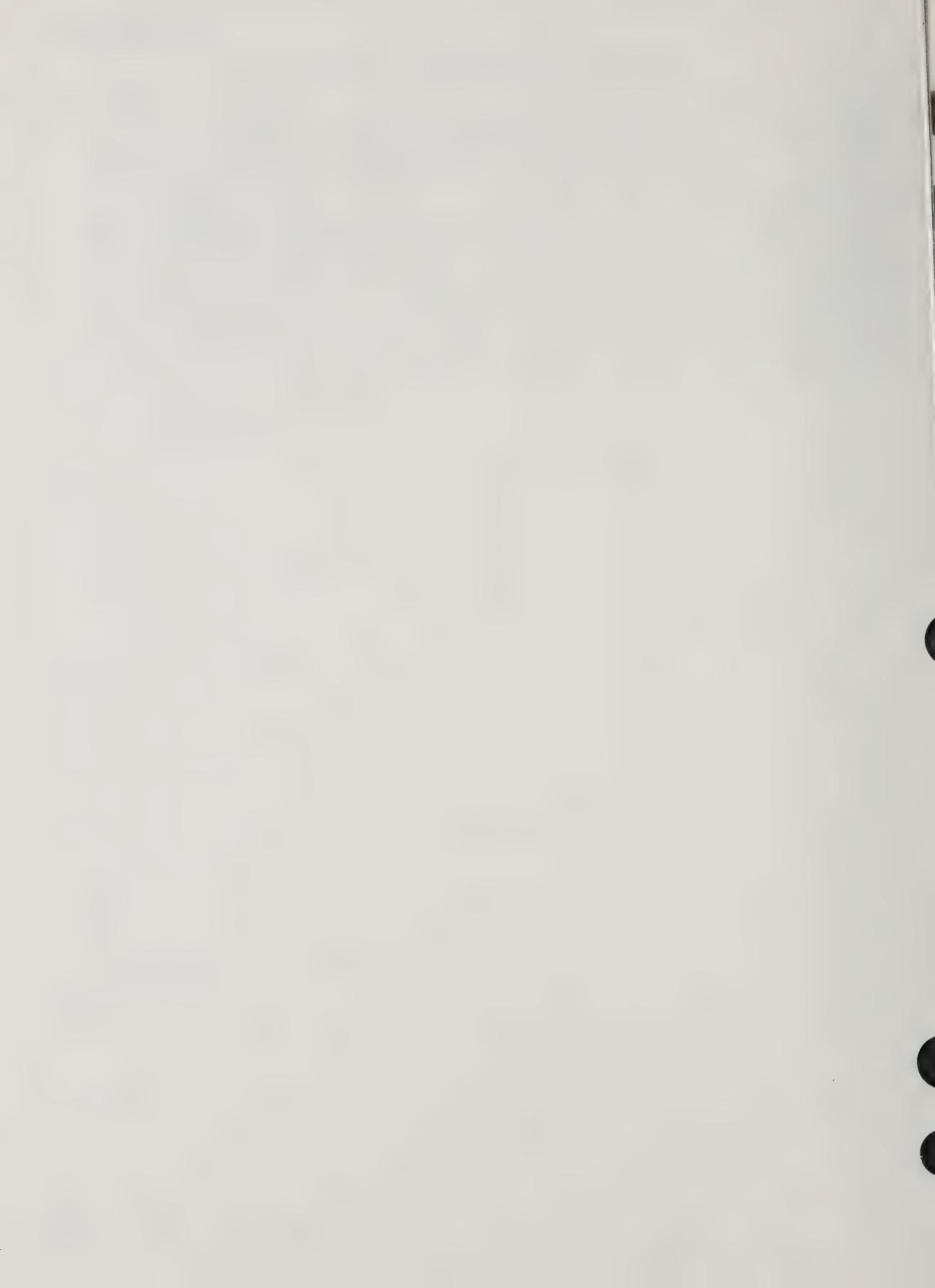
Dimensions:

Length	171 inches.
Width	86 inches.
Height	83 inches.
Weight	5,305 lbs

f. Telephone Signal Converter CV-1548/G.

No. of channels	12.
One-way plug supervision (18A3 panels)	
Operating modes (selected independently in each channel)	20-Hz signaling, 2-wire, plug supervision signaling, 2-wire (one-way from originator to terminator). No signaling, 2-wire (hybrid only in use). No signaling, 4-wire (channel patched straight through).
20-Hz signaling, 2-wire: From subscriber	Ringing voltage at 21 volts (panel 18A3A) or 16 volts (panel 18A3B) rms minimum.

To subscriber	20-Hz ringing voltages at 75 volts rms minimum (across four lines simultaneously).
Plug supervision signaling, 2-wire modes:	
Originate (OR)	Switchboard trunk opens or closes T (tip) and R (ring) lead circuit in 18A3A or 18A3B panel.
Terminate (TE)	18A3A or 18A3B panel opens or closes T (tip) and R (ring) lead circuit in switchboard trunk.
Two-way plug supervision (18A4 panels)	
Multiplex terminal inputs and outputs, 4-wire (all signaling modes).	
From multiplex terminal	No tone or 1,600 Hz in-band between -25 and 0 dbm.
To multiplex terminal	No tone or 1,600 Hz in-band tone at -15 dbm (adjustable \pm 5db).
Channel characteristics (2-wire):	
Insertion loss	4.5 db maximum (250 to 3,500 Hz).
Input and output	600 ohms (balanced to ground).
Power requirements	109 to 121 volts, 47 to 420 Hz, 17 watts (idle) 60 watts (all channels ringing).
Operating temperature limits	$\pm 125^{\circ}\text{F}$ to -25°f .



1-6. Components and Dimensions

Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb.)
Air conditioner	15 3/4	26	28	171
Switchboard, Telephone, Manual SB-1398/GTA-14(V)	62 7/8	34 3/4	23 3/4	690
Panel, Power Distribution SB-1399/GTA-14(V).....	48	16	23 1/4	400
Telephone Circuit, Line Relay TA-452/GTA-14(V)	24	14 1/4	28 3/8	230
Main Distribution Frame, Telephone TA-454/GTA-14(V)	24	14 1/4	28 3/8	110
Telephone Circuit Trunk Relay TA-276/TTC	26 5/8	17	31 5/16	251
Converter, Telephone Signal CV-1548/G*	8 1/2	17 1/4	12	54

*Not used in AN/TTC-23A

1-6.1. Items Comprising an Operable Central Office, Telephone, Manual AN/TCC-23 and 23A

NSN	Qty	Nomenclature, part No., and mfr code
		<p>NOTE The part number is followed by the applicable 5-digit Federal supply code for manufacturers (FSCM) identified in SB 708-42 and used to identify manufacturer, distributor, or Government agency, etc.</p>
		<p>NOTE Dry batteries are shown used with the equipment but are not considered part of the equipment. They will not be preshipped automatically but are to be requisitioned in quantities necessary for the particular organization in accordance with SB 11-6.</p>
4120-679-2669	1	Air Conditioner: F-9000-2; 94833
	1	Basket, Waste Paper: SC-D-539454; 80063
6135-120-1020		Battery Dry BA-30
6140-583-9348	4	Battery, Wet BB-46: P/o AN/GTA-14(V)
6350-295-1766	1	Bell Assembly, Electrical: P/o AN/GTA-14(V); f/night alarm; SM-B-183244; 80063
4210-595-4085	1	Bracket: F/fire extinguisher; RB-1; 33525
7920-178-8315	1	Brush, Dusting, Bench: SC-C-539469; 80063
5995-134-7159	1	Cable Assembly And Reel ft lg power cable assy and Reel RC-435/U; SM-D-352732; 80063
	3	Cable Assembly, Power Electrical CX-3692/U: p/o AN/GTA-14(V); 4 ft lg
5995-105-9311	1	Cable Assembly, Power Electrical CX-3692/U: p/o AN/GTA-14(V); 33 ft lg
5995-173-6163	1	Cable Assembly, Power, Electrical CX-3694/U: p/o AN/GTA-14(V); 4 ft lg
5995-681-8507	1	Cable Assembly, Power, Electrical CX-4762/U: p/o AN/GTA-14(V); 4 ft lg
5995-105-9312	1	Cable Assembly, Power, Electrical CX-4762/U: p/o AN/GTA-14(V); 33 ft lg
5995-00-935-3704	1	Cable Assembly, Power, Electrical CX-4845/U: p/o AN/GTA-14(V); 6 ft 2 in. lg
5995-00-935-2686	1	Cable Assembly, Power Electrical CX-7705A/U: 15 ft lg power stub
5995-00-103-2377	1	Cable Assembly, Power Electrical CX-11758/U: p/o AN/GTA-14(V); 3 ft lg
5995-102-9972	1	Cable Assembly, Power Electrical CX-11759/U: p/o AN/GTA-14(V); 33 ft lg
5995-935-2704	1	Cable Assembly, Power, Electrical: F/air conditioner; SC-D-543403; 80063
5995-284-6353	3	Cable Assembly, Telephone CX-2584/U: p/o AN/GTA-14(V); 8 ft 6 in. lg
5995-753-2021	2	Cable Assembly, Telephone CX-4566A/G: 26 pair sig cable assy; 25 ft lg
5995-752-2566	3	Cable Assembly, Telephone: For TA-312/PT and LS-147C/FI; 3 ft lg; SC-D-383873 Gp II; 80063
	1	Chair Rotary: SC-D-539551; 80063 (When replacing, remove mtg bracket f/use on new chair).
7110-00-817-0220	2	Chair, Rotary: p/o AN/GTA-14(V); 776AR; 18216
7910-900-1678	1	Cleaner, Vacuum: 2830; 29335
6645-410-2395	1	Clock, Aircraft, Mechanical: SC-C-539475; 80063
5805-069-8795	1*	Converter, Telephone Signal CV-1548/G, less cover.
5995-164-6577	1	Cord CD-413: p/o AN/GTA-14(V); 40 in. lg
	4	Counter, Reciprocating: P/o AN/GTA-14(V); SM-B-183273; 80063
6110-985-7574	2	Distribution Box J-1077A/U
5120-293-2696	1	Extractor, Electron Tube: F/7 pin miniature; SC-B-539547; 80063
5120-293-1950	1	Extractor, Lamp: p/o AN/GTA-14(V); SM-B-183396; 80063
5120-293-1085	1	Extractor, Lamp Cap: p/o AN/GTA-14(V); SM-B-183365, 80063
	1	File, Rotary, Card: SM-D-350172; 80063
6115-738-6337	1	Generator Set, Gasoline Engine, Trailer Mounted PD-618/M: USED WITH BUT NOT PART OF THIS EQUIPMENT

NSN	Qty	Nomenclature, part No., and mfr code
5120-776-9917	8	Grip, Cable, Jaw: F/signal cables; SC-B-539592; 80063
5120-776-9918	1	Grip, Cable, Jaw: F/power cable; SC-B-539593; 80063
5965-892-1068	6	Headset-Microphone H-210/G; p/o AN/GTA-14(V)
4520-00-177-6198	2	Heater, Space, Electric: SC-D-539485; 80063
6630-663-4501	1	Hydrometer, Syringe, Battery TS-765/U
5830-752-5357	1	Intercommunication Station LS-147C/FI
2540-892-6243	1	Ladder Vehicle, Boarding MX-3391/6
6230-00-729-9614	1	Lantern, Electric: SC-C-539491; 80063
5995-00-102-8540	3	Lead, Electrical CX-11760/U; p/o AN/GTA-14(V); 16 in. lg; interconnects batteries BB-46
4940-00-752-2525	1	Lead, Electrical: 10 ft lg; SC-B-539492; 80063
	10	Lens, Indicator Light: White; p/o AN/GTA-14(V); SM-B-142804-1; 80063
6210-00-163-2614	10	Lens, Indicator Light: Red; p/o AN/GTA-14(V); SM-B-142804-2; 80063
	10	Lens, Indicator Light: Green; p/o AN/GTA-14(V); SM-B-142804-3; 80063
6210-00-163-1783	25	Lens, Indicator Light: White SWBD face; p/o AN/GTA-14(V); SM-B-142911; 80063
6210-00-163-1784	20	Lens, Indicator Light: Green, SWBD face; p/o AN/GTA-14(V); SC-B-339863-2; 80063
6230-00-239-3518	1	Lens, Indicator Light: Red, SWBD face; p/o AN/GTA-14(V); SC-B-339863-1; 80063
5805-00-855-9823	2	Light, Extension: 25 ft lg; SC-C-539496; 80063
5805-00-856-0048	1	Main Distribution Frame, Telephone TA-454/GTA-14(V)
5120-00-293-3603	1	Panel, Power Distribution SB-1399/GTA-14(V)
5935-00-161-1513	200	Pin Straightener, Electron Tube: SC-B-539472; 80063
5120-00-708-5312	2	Plug, Dummy, Telephone: p/o AN/GTA-14(V); SM-B-339971; 80063
	1	Screwdriver, Piloted: p/o AN/GTA-14(V); SM-B-183299; 80063
7520-00-162-6178	1	Screwdriver, Flat Tip: SC-C-539302-4; 80063
5410-00-006-8569	1	Sharpener, Pencil: SC-C-539503; 80063
5805-00-701-9183	12	Shelter, Electrical, Equipment S-280/G: (Modified)
5805-00-681-9710	40	Sleeve, Key: Signal plug; p/o AN/GTA-14(V); SM-B-183266; 80063
5805-00-892-1000	2	Sleeve, Plug: p/o AN/GTA-14(V); SM-B-183398; 80063
5805-00-503-3347	1*	Switchboard Telephone, Manual SB-1398/GTA-14(V)
5805-00-855-9821	1**	Telephone Circuit, Trunk Relay TA-276/TTC
5805-00-543-0012	2	Telephone Circuit, Line Relay TA-452/GTA-14(V)
6685-00-911-6344	1	Telephone Set TA-312/PT: Less Case
6145-00-284-1499	1000 ft	Thermostat: T473B1036; 40931
5120-00-449-8083	1	Wire WD-15/U
		Wrench, Adjustable: 10 in. lg; GGG-W-631, type 1, class 1; 81349

*Not used in AN/TTC-23A.

**Two each in AN/TTC-23A.

1-7. Description

a. **AN/TTC-23.** Central Office, Telephone, Manual AN/TTC-23 consists of one Converter, Telephone Signal CV-1548/G (fig. 1-3), two Telephone, Manual Switchboards, SB-1398/GTA-14(V) (fig. 1-3 and 1-4), two Main Distribution Frames TA-454/GTA-14(V) (fig. 1-4), one Power Distribution Panel SB-1399/GTA-14(V) (fig. 1-6), one Line-Relay Telephone Circuit TA-452/GTA-14(V) (fig. 1-4), one Truck Relay Telephone Circuit TA-276/TTC (fig. 1-4), and Intercommunication Station LS-147C/FI and wire chief's desk (fig. 1-6). The AN/TTC-23 is fully insulated, watertight, and airtight and can be transported by an air or ground vehicle. Ten fluorescent light fixtures, installed in the ceiling (fig. 1-9), provide lighting for the shelter. Six incandescent lights provide instant light when the temperature is too cold for fluorescent light illumination. Six 48-volt incandescent lights are provided for automatic emergency lighting. A BLACKOUT BYPASS

switch (fig. 1-5) is located just to the right of the door. When the switch is at ON and the door is open, the lights remain on. When the switch is at OFF and the door is open, the lights go off and the nightlights go on. Power and signal wiring is contained in metal raceways, with removable covers (fig. 1-5). There are convenience and equipment outlets on the wall and ceiling power ducts (figs. 1-5 and 1-9). The power entrance panel (fig. 1-11) and the signal entrance panel (fig. 1-12) are equipped with hinged protective covers for weather protection. An 8-day, 24-hour clock is mounted above Intercommunication Station LS-147C/FI and the wire chief's desk (fig. 1-10). An exhaust blower is provided for ventilation (fig. 1-7). The blower can be removed from outside the shelter and can be stored inside for transit. The operating components of Central Office, Telephone, Manual AN/TTC-23 are mounted on shelves and brackets that are secured to the shelter floor and walls. There are storage areas for running spares and accessory items.

b. AN/TTC-23A (fig. 1-3). Central Office, Telephone, Manual AN/TTC-23A is identical to AN/TTC-23 except that Telephone Circuit, Trunk Relay TA-276/TTC has been replaced by an additional Telephone Circuit, Line-Relay TA-452/GTA-14(V), and Converter, Telephone Signal CV-1548/G has been removed. Refer to paragraph 1-5*b* for the switching facilities available.

1-8. Description of Components of Central Office, Telephone Manual AN/

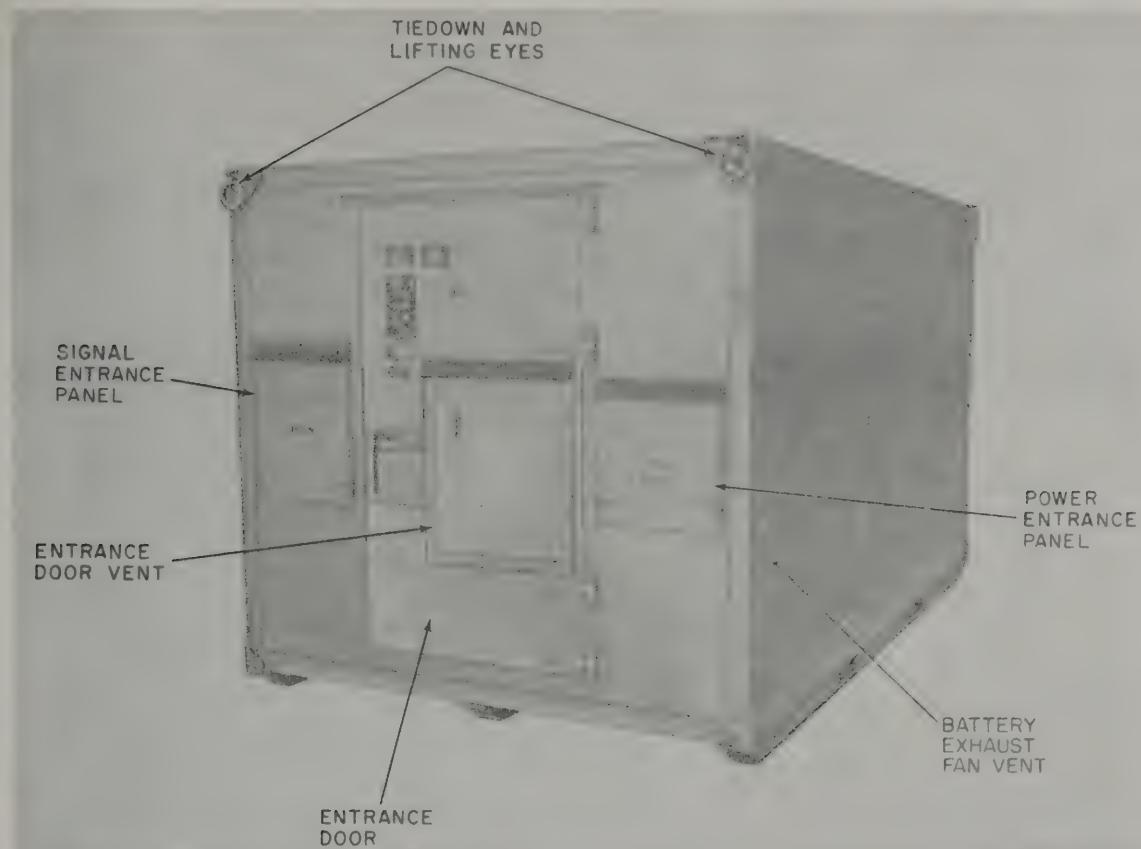
TTC-23

a. Electric Heater (fig. 1-14). Two heaters are secured in their mounting bases on the shelter floor (fig. 1-4). Each heater contains a 1.5-kilowatt heating element and a fan for air circulation. The fan operates when the heating element is turned on, but may also be operated independently. Horizontal louvers on the front of the unit are adjustable to deflect the airstream. Operating controls are on the top of the heater, the



b. *Intercommunication Station LS-147C/FI* (fig. 1-10). The LS-147C/FI is mounted above the wire

other LS-147C/FI's or equivalent equipment.



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Figure 1-1. Central Office, Telephone, Manual, AN/TTC-23, rear curbside view.

c. *Air Conditioner*. (fig. 1-15). The model F-9000-2 air conditioner is air-cooled, self-contained, base-mounted, and requires an external power source of 115 volts, 60 hertz (Hz), single phase, alternating current (ac) electrical power for operation. The air conditioner has a cooling capacity of 9,000 Btu/hr at 125°F. ambient air temperature.

d. *Ancillary Components*.

(1) *Power cable assembly and reel* (fig. 1-16). Power Cable Assembly CX-7453A/U is wound on Reel RC-435/U which, during transport, is secured to the floor at the front of the shelter (fig. 1-4). It is a 100-foot, 3-conductor cable with a watertight power connector at each end.

(2) *Power cable stuff* (fig. 1-16). Power Cable CX-7705A/U is a 15-foot, 3-conductor cable with a watertight power connector on one end, and green white, and black prepared leads on the other end.

(3) *Cable Assembly, Telephone CX-4566A/U* (fig.

1-16). The CX-4566A/U is 25 feet long and is equipped with a 26-pair cable connector on each end.

(4) *Telephone and intercommunications cable assemblies* (fig. 1-16). The telephone and intercommunications cable assemblies are two-connector cords with telephone plugs on one end and prepared leads on the other end. They are used to connect Telephone Set TA-312/PT and Intercommunication Station LS-147C/FI to their signal duct jacks.

(5) *Air conditioner power cable* (fig. 1-16). The air conditioner power cable is a 4-foot, 3-conductor cable with watertight connectors at each end.

e. *Telephone Set TA-312/PT*. Two TA-312 PT's TM 11-5805-201-12; (less carrying case) are mounted above the wire chief's desk (fig. 1-10). The TA-312/PT's are arranged for common-battery operation and are used for the local telephone and wire chief's circuits.

f. *Converter, Telephone Signal CV-1548/G*. The CV-1548/G provides telephone signal conversion and

hybrid facilities for 12 multiplex channels. Each channel contains one-way supervision and ringdown signaling conversion facilities, a hybrid for converting between 2-wire and 4-wire circuits, 4-wire straight-through patching, and switching for select-

ing combinations of these functions.

g. *Distribution Box J-1077A/U* (fig. 1-8). The J-1077A/U is a terminal box which can be used to connect field wires to a 26-pair cable connector.

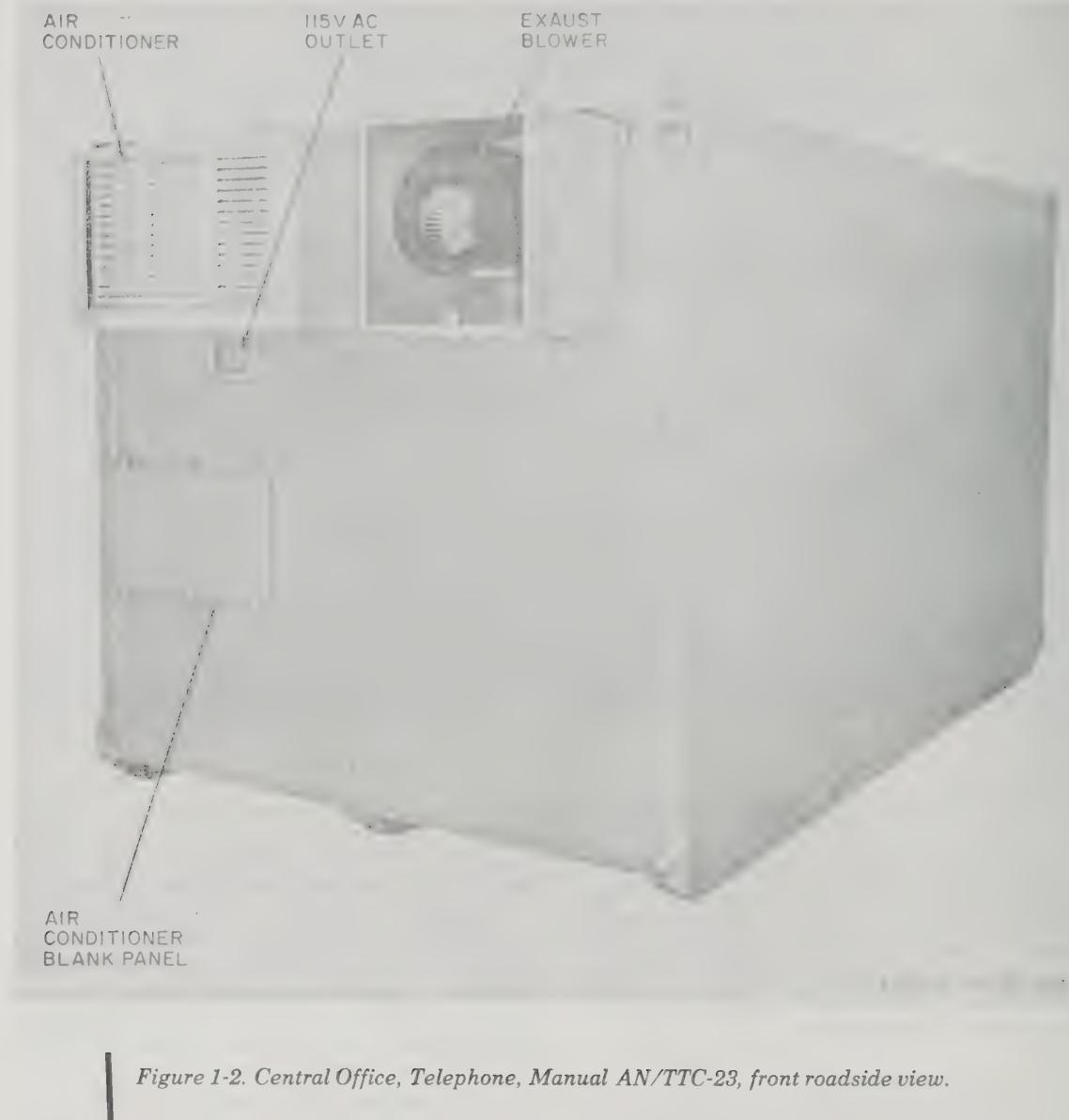


Figure 1-2. Central Office, Telephone, Manual AN/TTC-23, front roadside view.

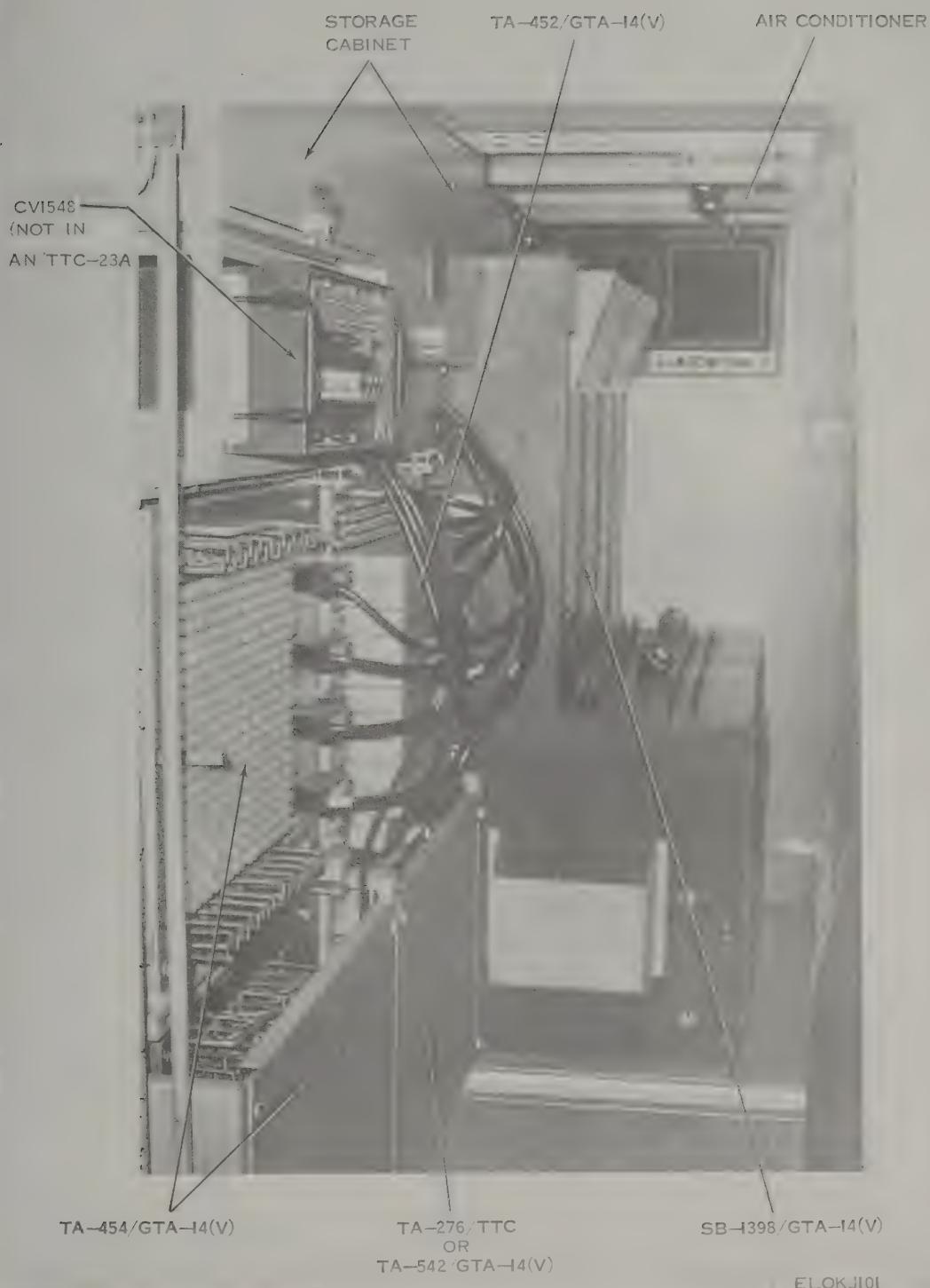
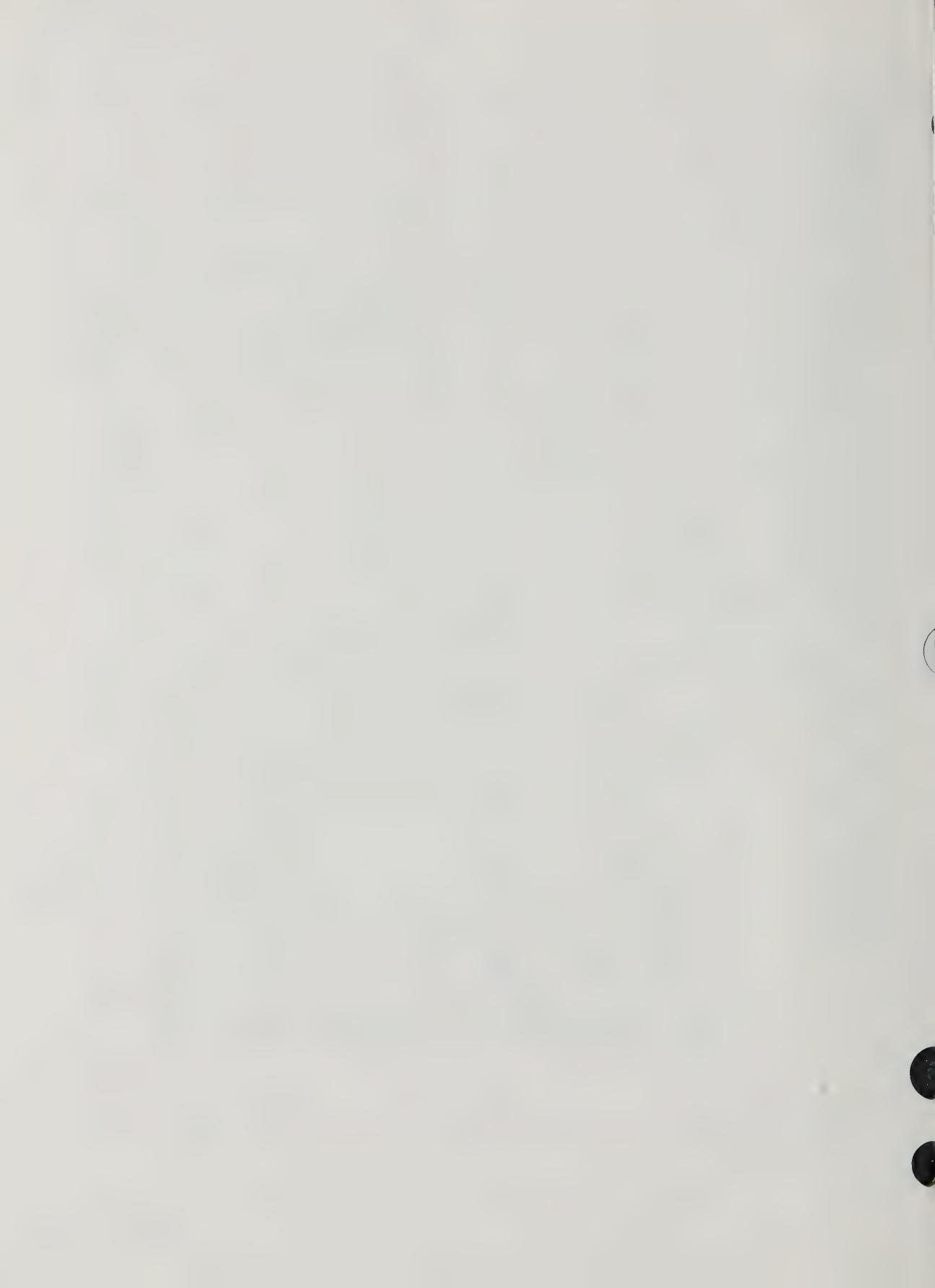
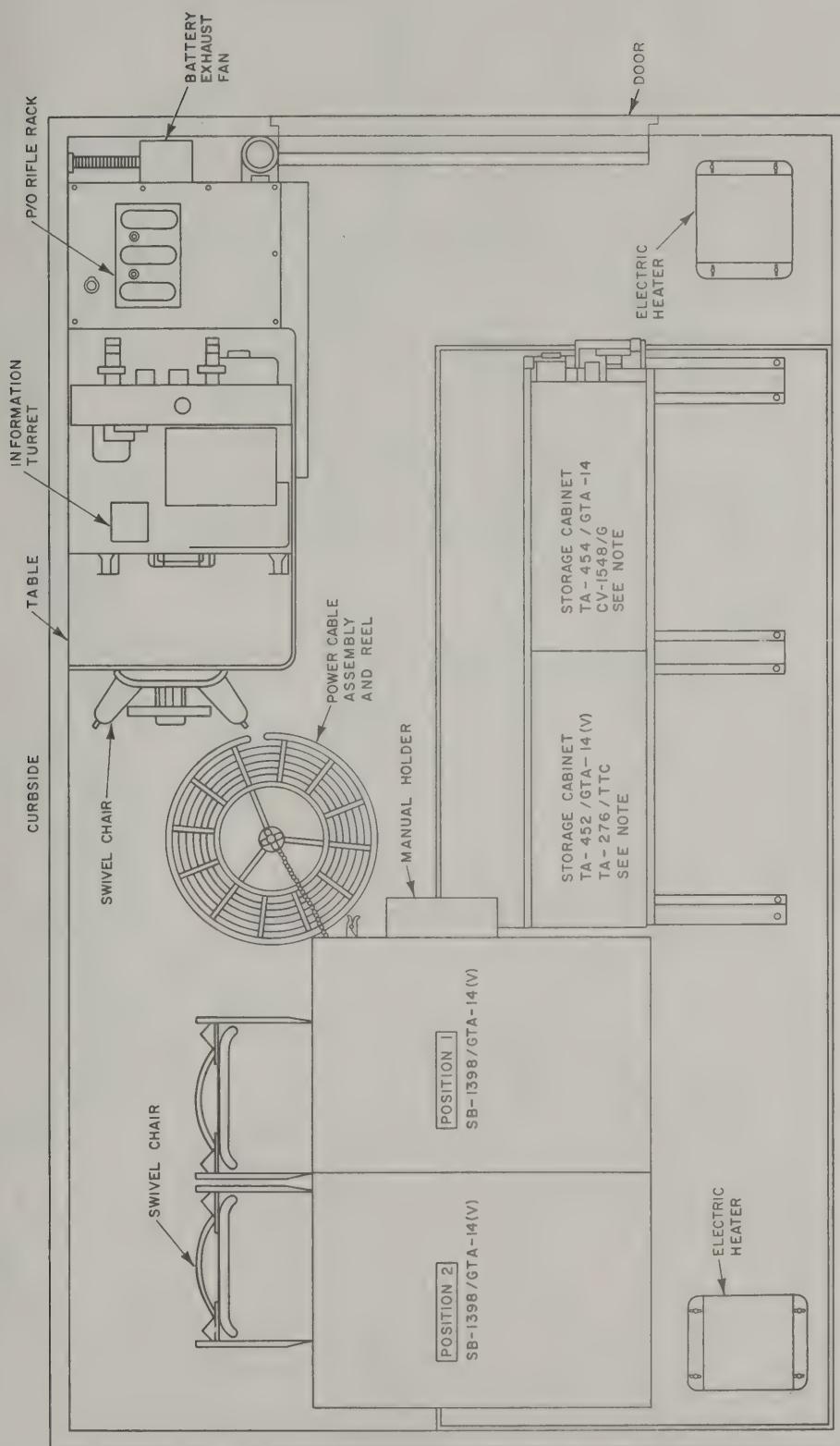


Figure 1-3. Central Office, Telephone, Manual AN/TTC-23, interior front view.





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Figure 1-4. Central Office, Telephone, Manual.

ROADSIDE



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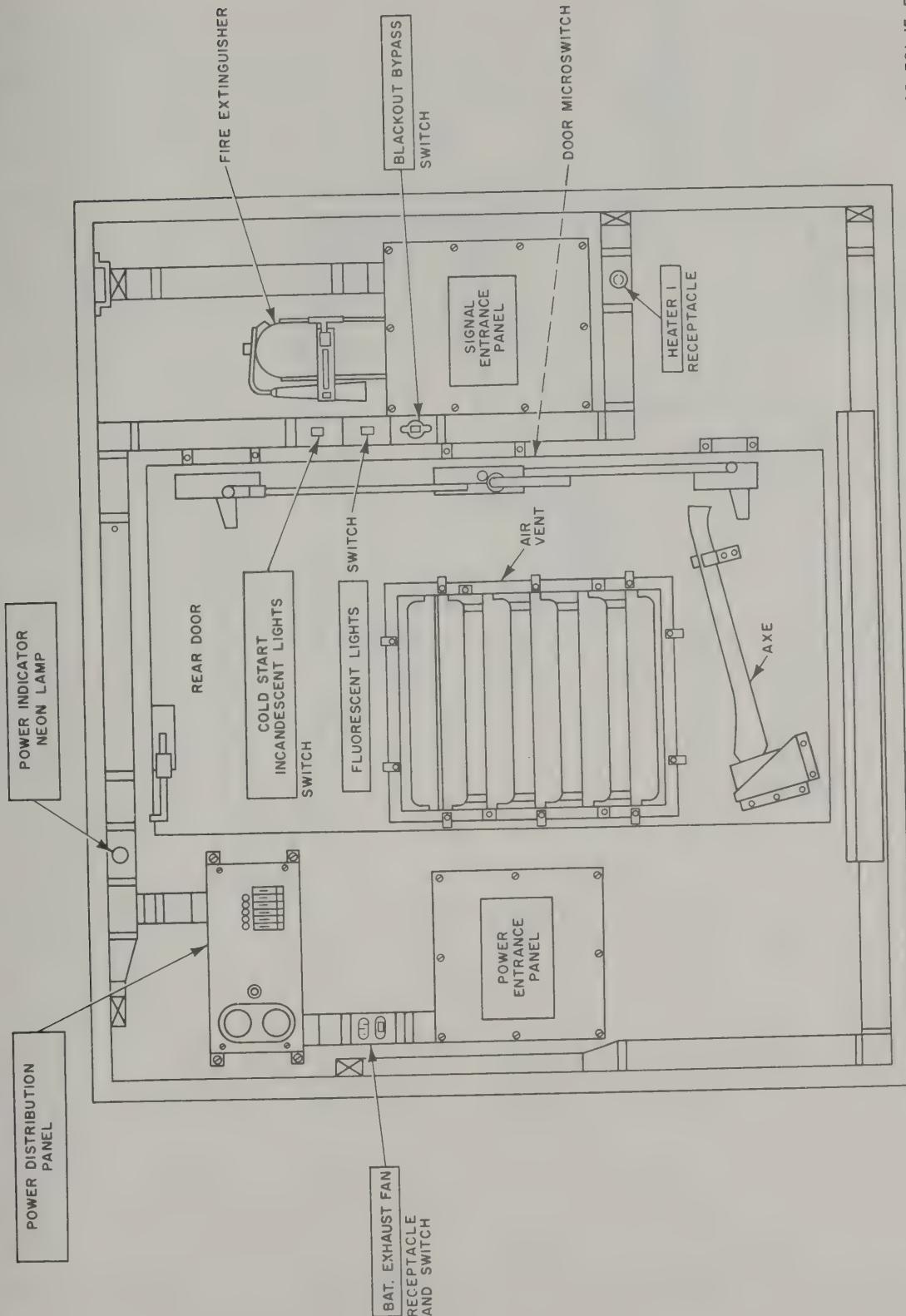


Figure 1-5. Central Office, Telephone, Manual AN/TTC-23, rear wall, elevation diagram.

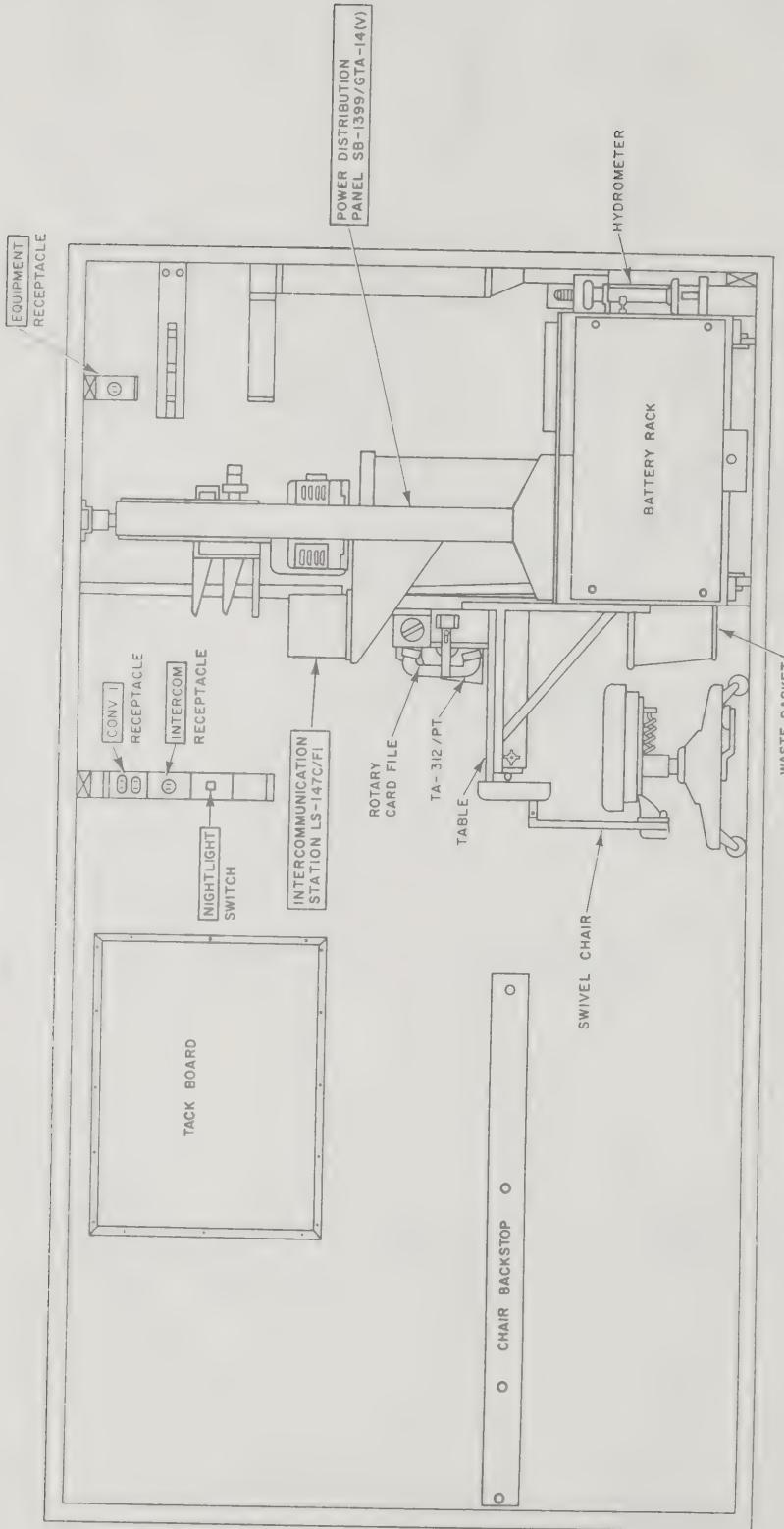
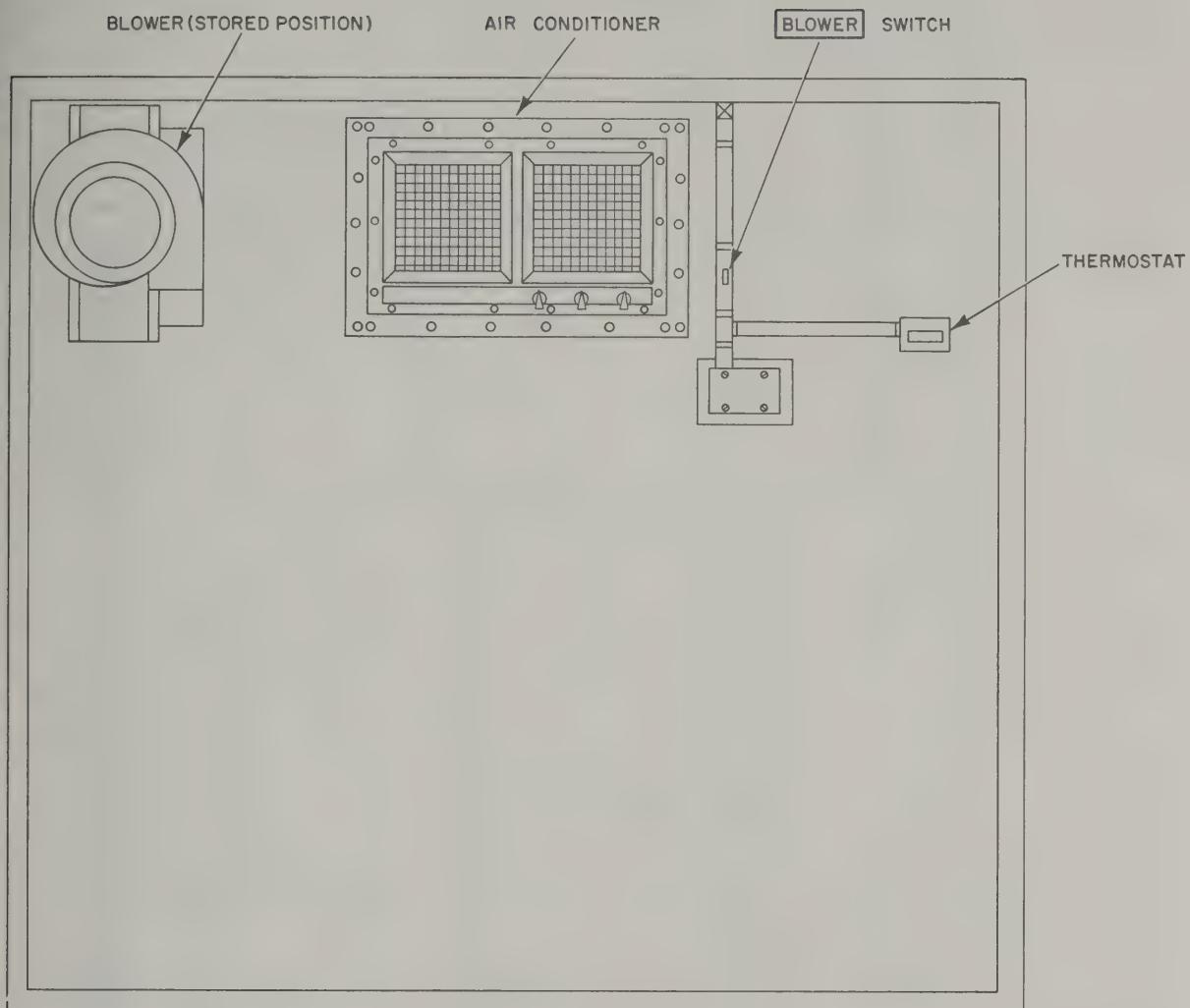
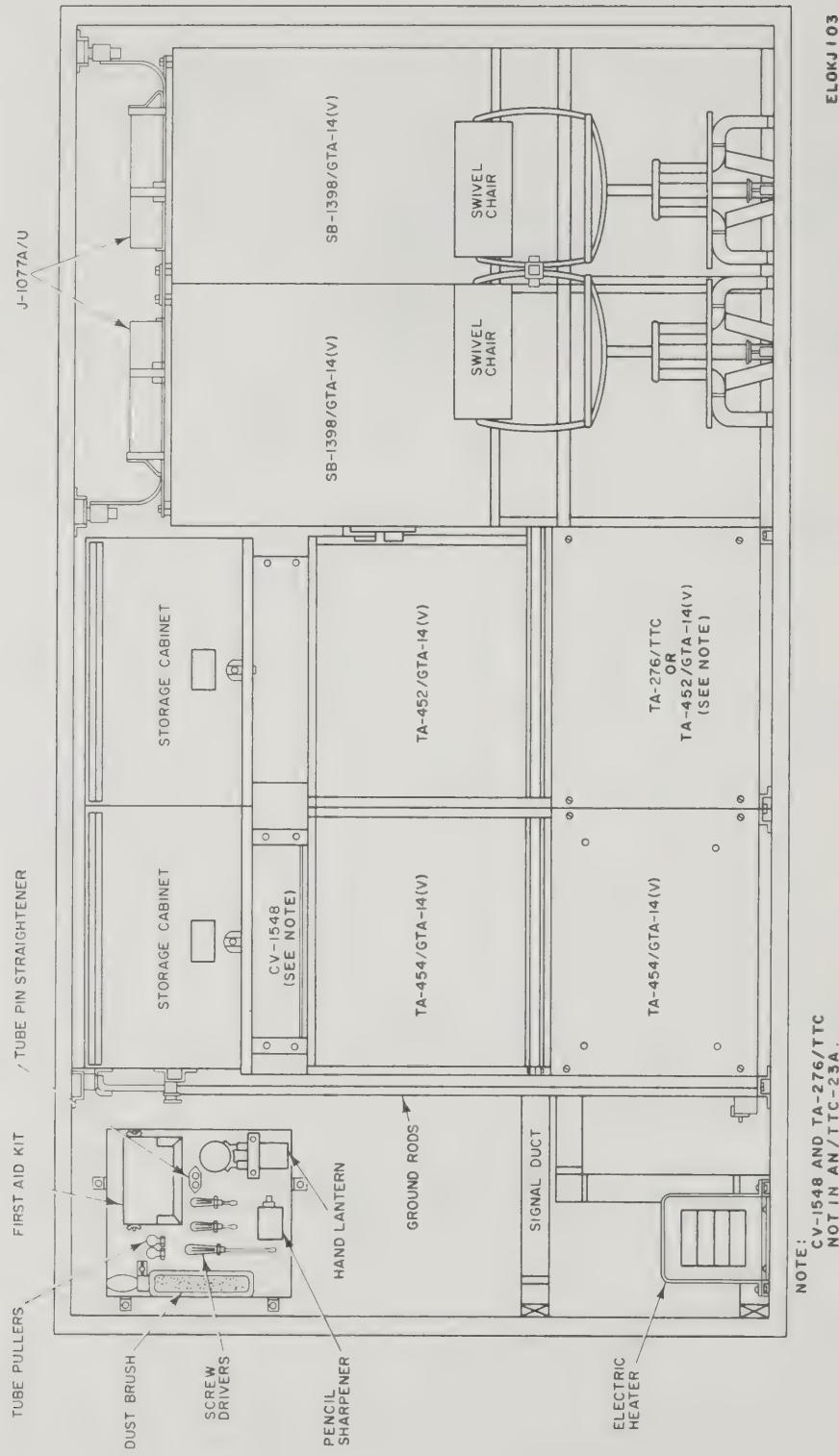


Figure 1-6. Central Office, Telephone, Manual AN/TTC-23,
curbside wall, elevation diagram.



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Figure 1-7. Central Office, Telephone, Manual AN/TTC-23, front wall, elevation diagram.



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Figure 1-8. Central Office, Telephone, Manual AN/TTC-23, roadside wall and central aisle, elevation diagram.

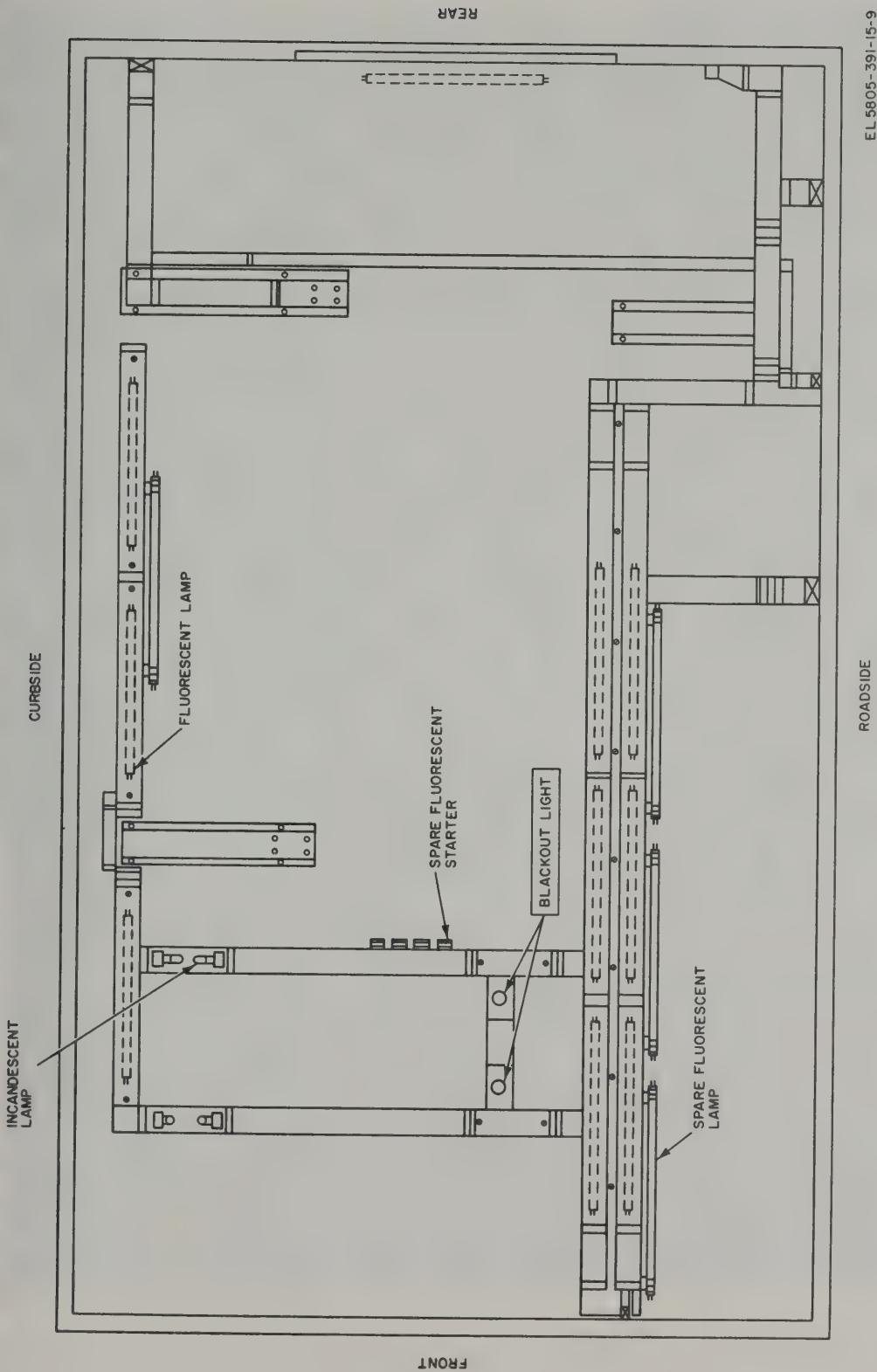


Figure 1-9. Central Office, Telephone, Manual AN/TTC-23, ceiling plan.

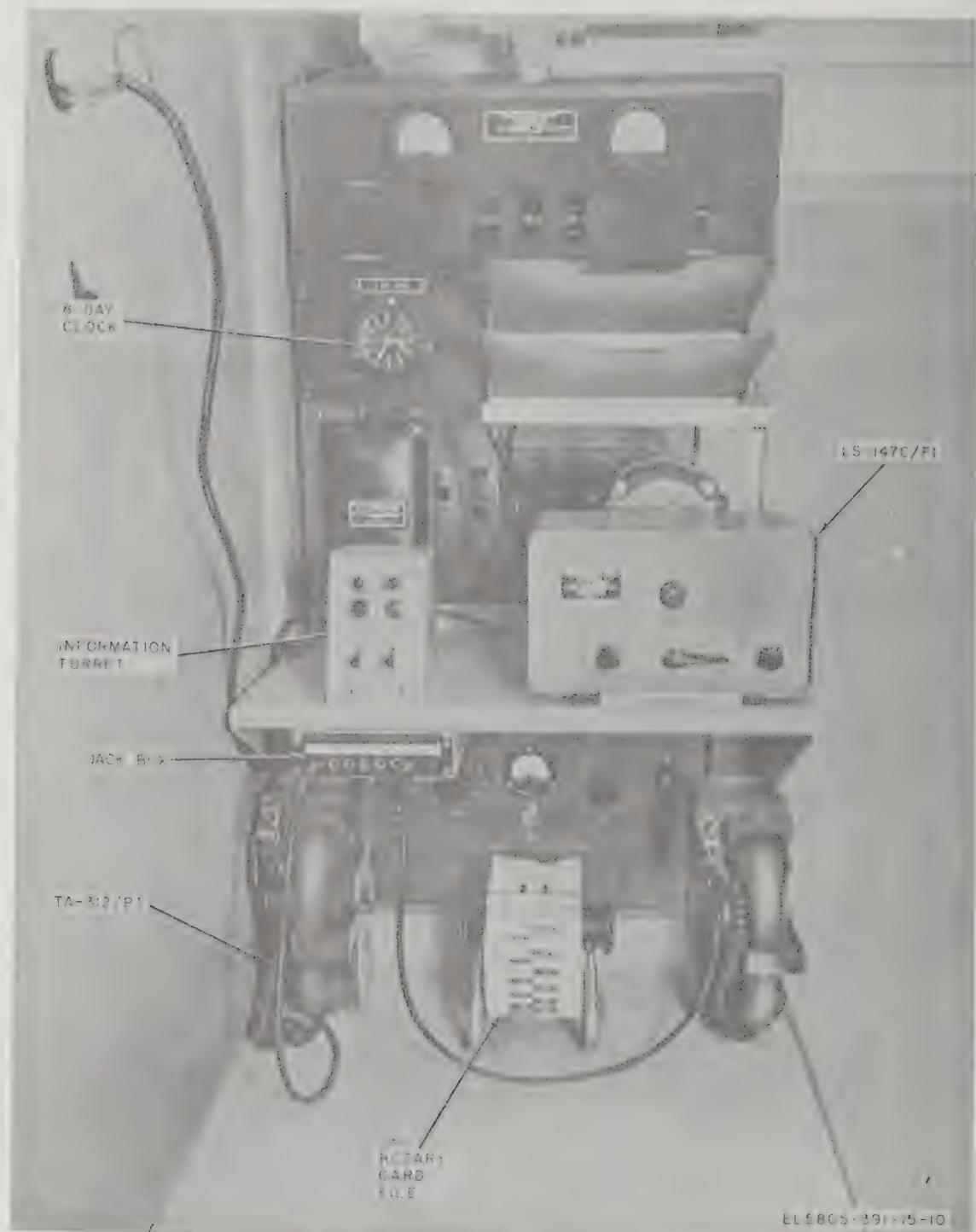


Figure 1-10. Intercommunication Station LS-147C/FI and wire chief's desk.

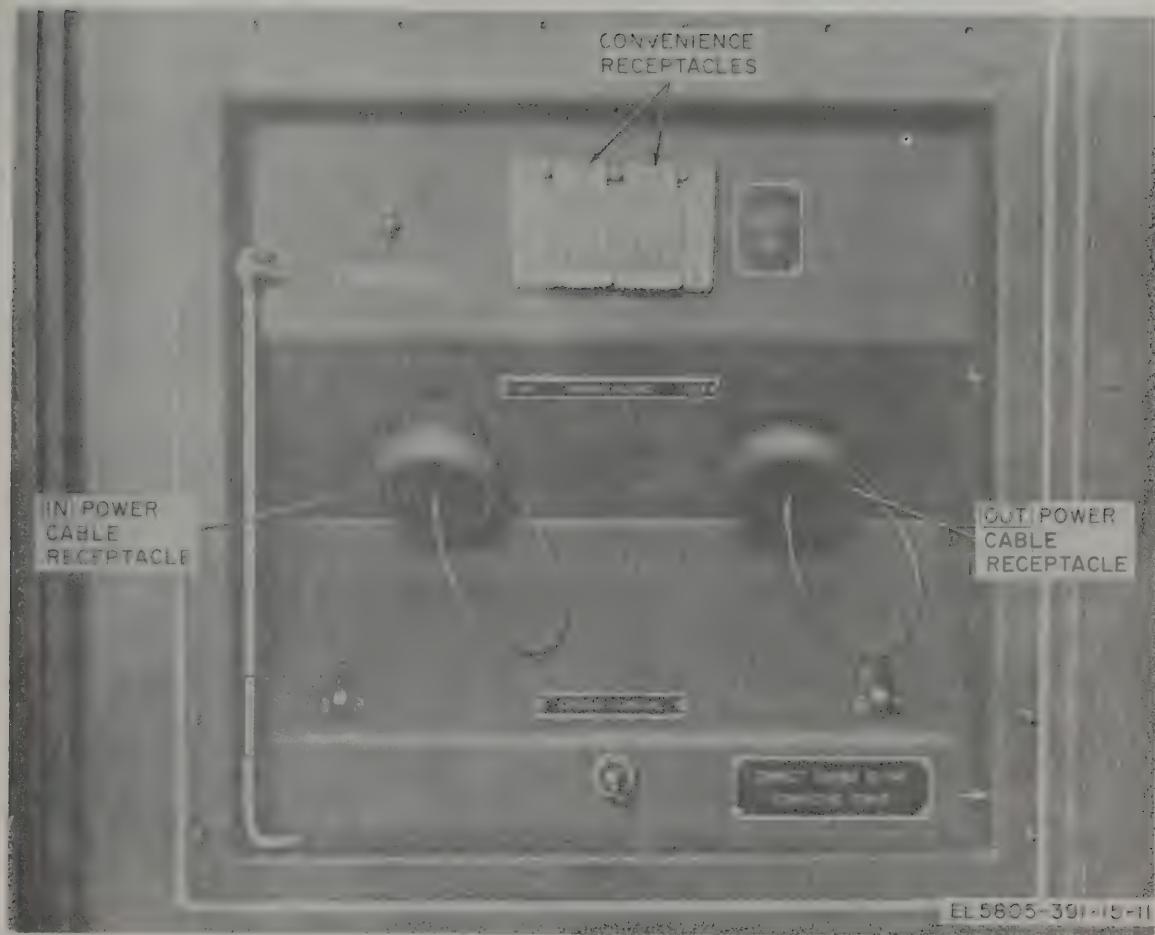
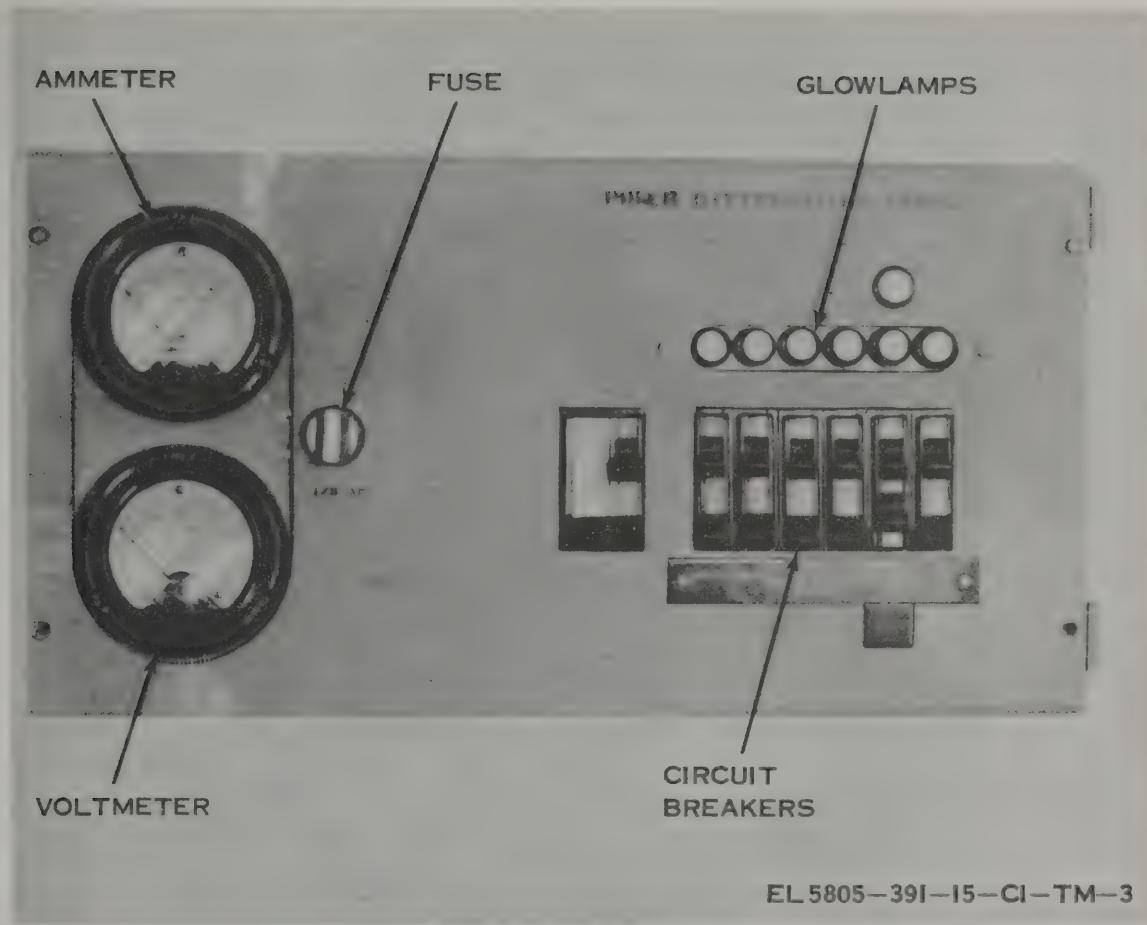


Figure 1-11. Power entrance panel, exterior front view.



Figure 1-12. Signal entrance panel, exterior front view.



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Figure 1-13. Power distribution panel.



EL 5805-391-15-TM-14

Figure 1-14. Electric heater.

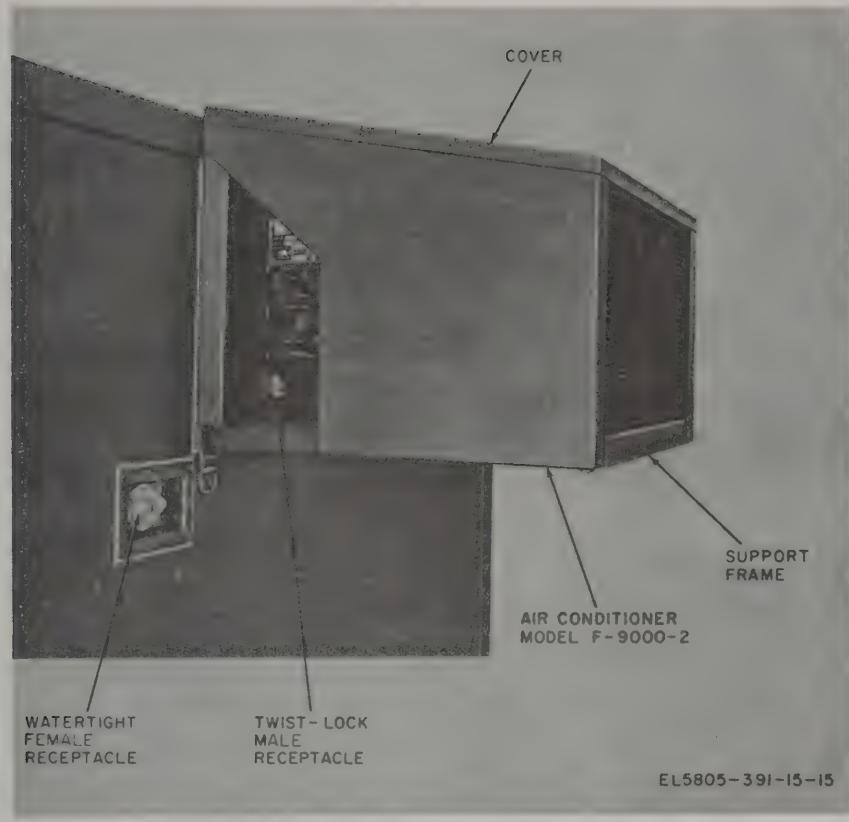


Figure 1-15. Air conditioner.

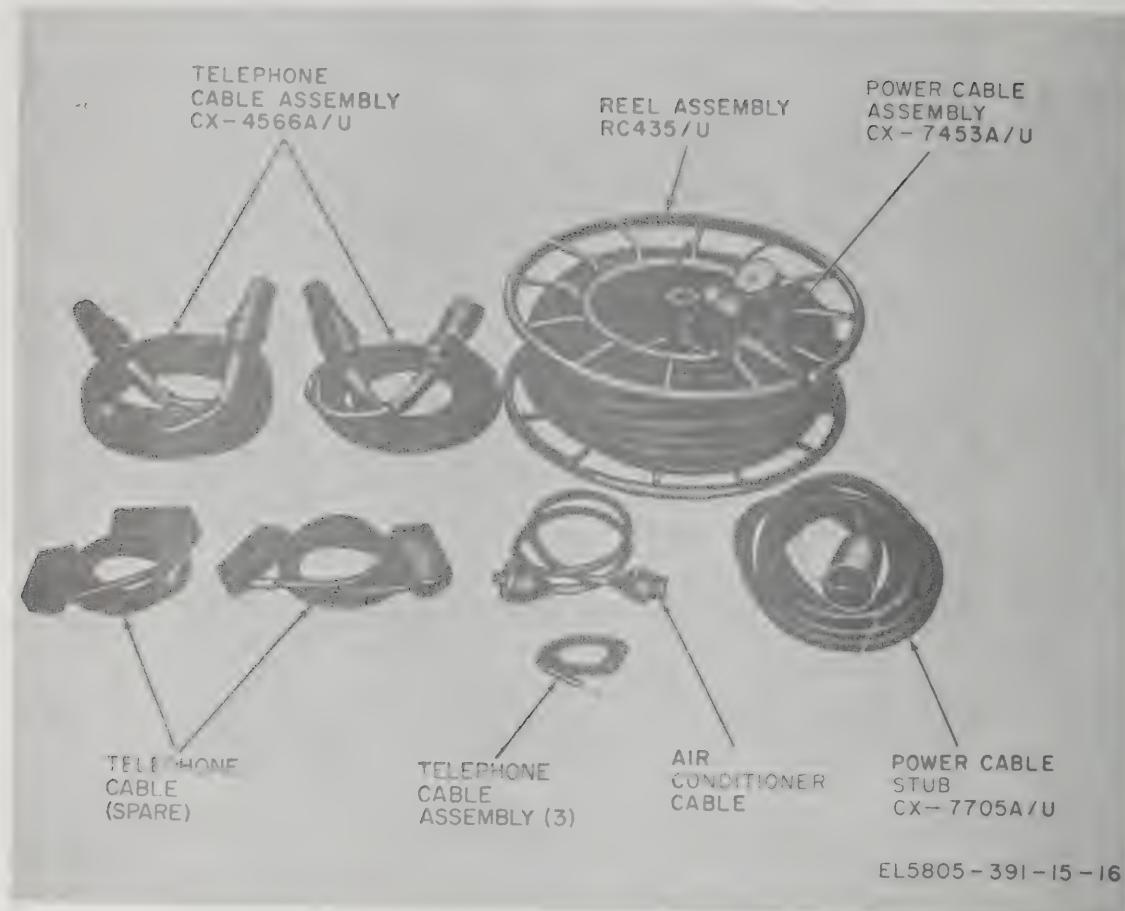


Figure 1-16. Central Office, Telephone, Manual AN/TTC-28,
-cable assemblies and reels.

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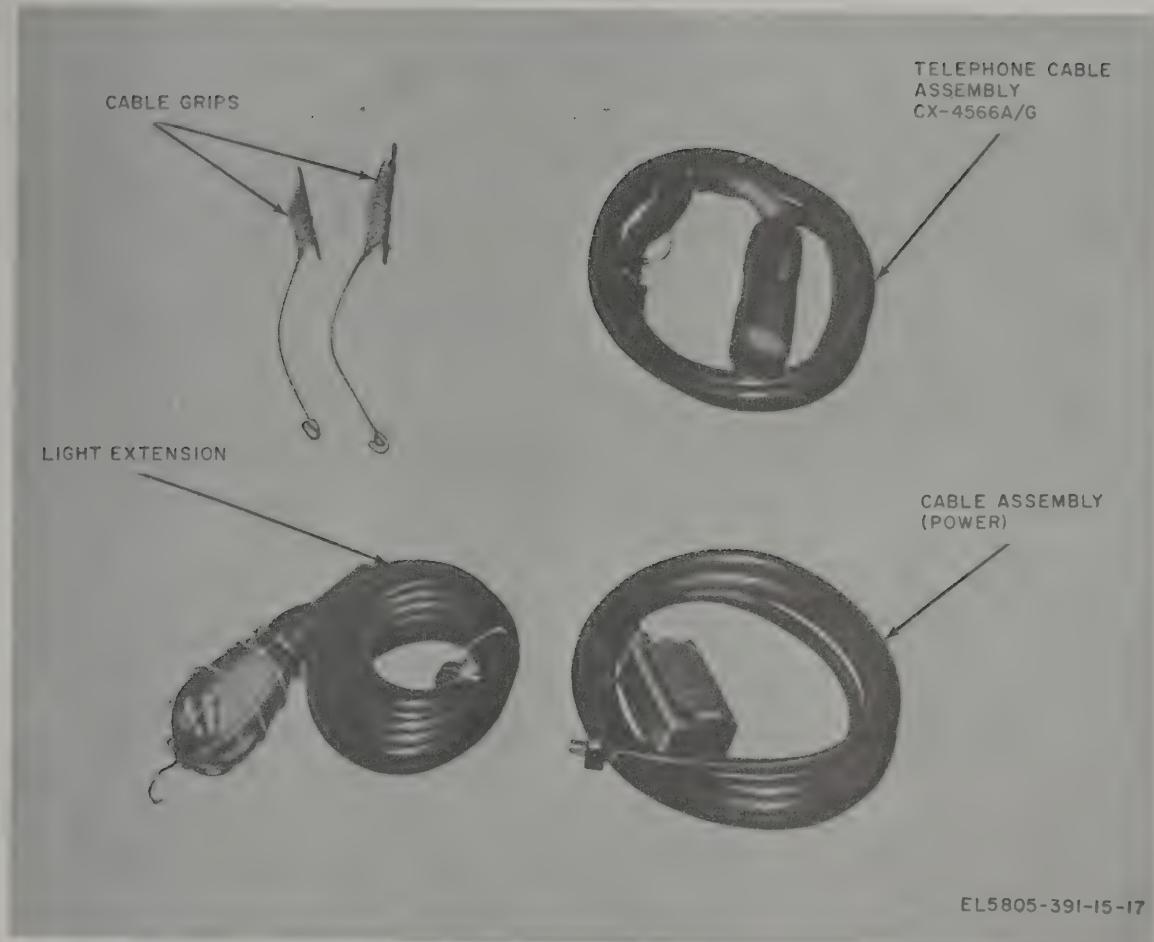


Figure 1-17. Central Office, Telephone, Manual AN/TTC-23, tools and accessories.

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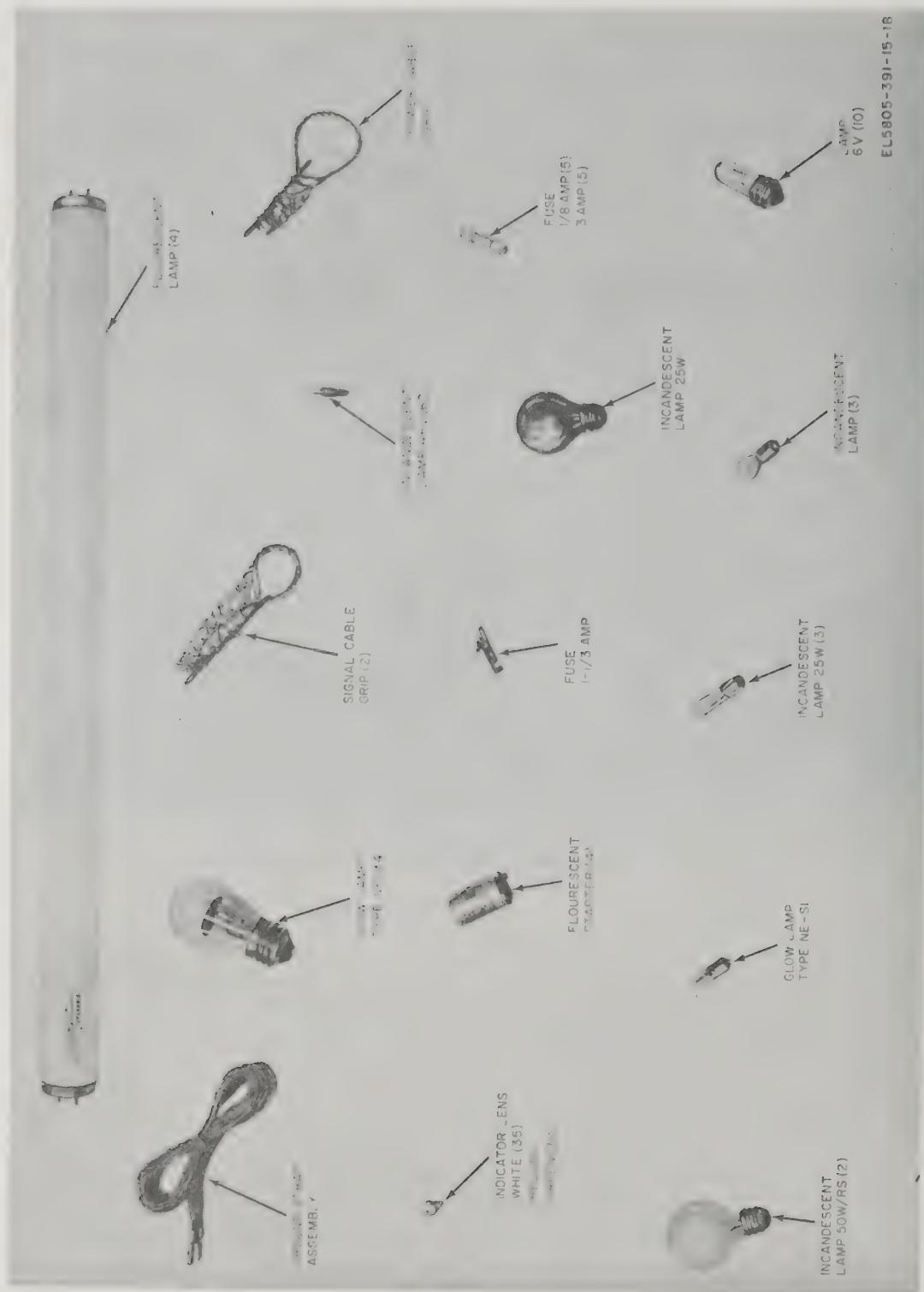


Figure 1-18. Central Office, Telephone, Manual AN/TTC-23 running spares.

CHAPTER 2

INSTALLATION

2-1. Unpacking and Checking

a. *Packaging Data.* Central Office, Telephone, Manual AN/TCC-23 (fig. 2-1) is packed in a reusable wooden crate. The shelter, which houses the equipment, is anchored to eyebolts in the skid base of the crate. The skid base has entries for handling with a forklift. The dimensions of the crate are 155 by 93 by 94 inches. The volume is 874 cubic feet, and the weight of the crated AN/TTC-23 is approximately 6,000 pounds.

b. *Uncrating.*

CAUTION

Do not thrust any tools into the interior of any pack or package.

(1) Unfasten the lag bolts with wrenches and remove the top, front, rear, and side panels from the crate base (fig. 2-1).

(2) Loosen the turnbuckles and detach the tiedowns from the eyebolts in the skid base of the crate.

(3) Remove the wooden blocking from the sides and ends of the shelter.

CAUTION

Be careful when handling tools, because the aluminum skin of the shelter can be easily punctured.

(4) Remove the shelter from the crate base. Use an overhead lifting device whenever available; if a lifting device is not available, remove the headers from the crate base and lift the shelter from either side with a forklift, or drag it from the base by the towing eyes.

WARNING

The overhead lifting device or other lifting equipment must be capable of lifting or handling 10,000 pounds.

(5) Send the crate to a local storage area for reuse.

c. *Checking AN/TTC-23 Contents.*

(1) Inspect the equipment for damage that may have occurred during shipment.

(2) Check to see that the equipment is complete as listed on the packing slip. Report all discrepancies in accordance with TM 38-750. The equipment should

be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

(3) Check to see whether the equipment has been modified. If the equipment has been modified, the MWO number will appear on the front panel near the nomenclature plate. Check also to see whether all MWO's current at the time the equipment is placed in use have been applied.

NOTE

Current MWO's applicable to the equipment are listed in DA Pam 310-7.

(4) Check the latest issue of DA Pam 310-4 (never more than 1 year old) and its latest changes (never more than 6 months old) to see whether the latest editions of all applicable maintenance literature are available.

NOTE

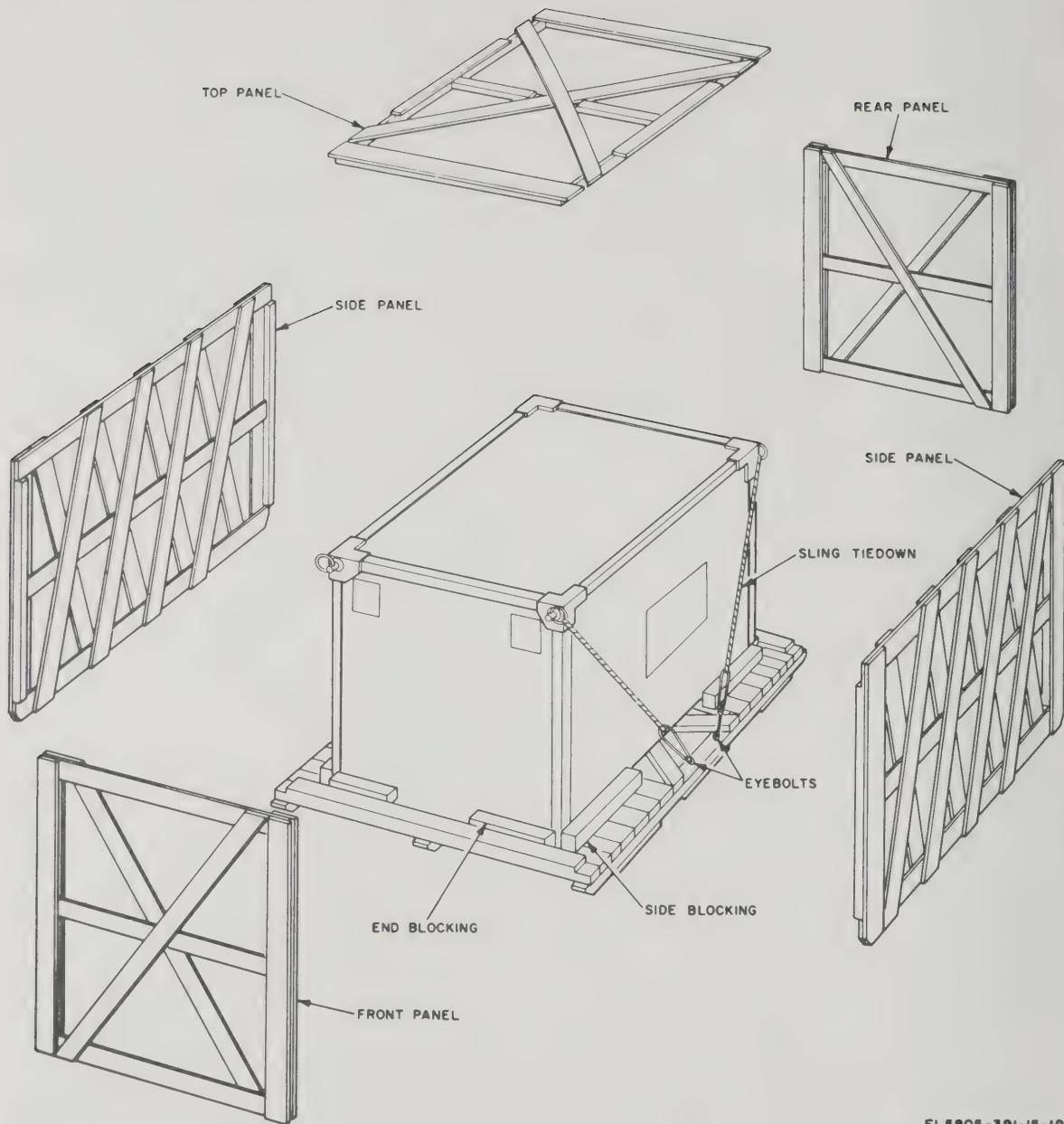
For unpacking and checking major components, refer to applicable technical manual (app A).

2-2. Siting

a. *General.* The location of the AN/TTC-23 will depend on the tactical situation, standard operating procedure (SOP), and location of the other assemblies in the area communications network. Normally, the AN/TTC-23 should be located near the heaviest concentration of telephone stations to reduce the outside plant requirements. However, the location of the carrier terminals, radio equipment, operation centers, and other equipment should be considered in the installation of the AN/TTC-23.

b. *Method of Installation.* The AN/TTC-23 may be installed either on truck or on the ground.

c. *Location.* Position the AN/TTC-23 in such a manner as to make both power and telephone connections as convenient as possible. Orientation of the AN/TTC-23 should take into consideration access to the shelter entrance and general topographic features of the terrain. Such factors as drainage and accessibility to the shelter by prime movers and loading equipment should also be considered in the placement of the shelter.



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Figure 2-1. Typical packaging diagram.

2-3. Installation

Note. Four men and a device capable of lifting 10,000 pounds are required.

a. Lifting and Loading (fig. 2-2). If the

AN/TTC-23 is to be transported by helicopter, follow only the procedure given in (1) through (4) below. If the AN/TTC-23 is to be installed on a truck, follow the procedure given in (1) through (10) below.

(1) Use the sling hooks (nearest turnbuckle) to connect the sling to the lifting eyes of the shelter.

(2) Place the sling assembly on top of the shelter.

(3) Connect the four sling hooks to the lifting ring.

(4) Place the lifting ring over the hook on the lifting device.

Warning: To avoid injury to personnel and damage to equipment, permit only the personnel engaged in the actual loading operation to be near the truck, lifting device, and shelter. To eliminate confusion, all instructions must come from the loading crew supervisor.

(5) Tie a 1/2-inch rope (at least 15 feet long) to each towing eye.

(6) Lower the tailgate of the truck; make sure all tools and equipment have been removed from the truck body.

(7) Slowly lift the shelter from the ground to a position high enough to clear the bed of the truck.

Note. The entrance door of the shelter must be at the rear of the truck, and the front end of the shelter must be flush against the front of the truck bed.

(8) Back the truck into position under the shelter.

Warning: All personnel must remain clear of the truck while the shelter is being lowered into position.

(9) Position a man at each of the 1/2-inch ropes to guide the shelter into position, and slowly lower it into the truck.

(10) Remove the lifting ring from the lifting hook and disassemble the ring and the sling hooks. Remove the sling hooks from the lifting and tiedown eyes, and the 1/2-inch rope from the rear towing eyes. Raise and secure the truck tailgate.

b. Securing AN/TTC-23 on Truck (fig. 2-3).

(1) Install a tiedown ring assembly (part of the sling assembly) in the center support of each cargo bed side rail of the truck.

(2) At each side of the shelter, use the hook at the end farthest from the turnbuckle to hook each sling assembly to a lifting and tiedown eye of the shelter, secure the sling hooks at the opposite end of the cables to the tiedown ring.

(3) Tighten all turnbuckles evenly by hand, and then turn each turnbuckle an additional one-half turn with a bar or rod inserted into the slot of the turnbuckle.

Caution: Do not overtighten the turnbuckle. Overtightening the turnbuckles will damage the shelter.

(4) After the truck is driven to the operating site, lower the tailgate to the horizontal position; then remove the ladder from the shelter and secure it to the left side of the tailgate.

c. Unloading AN/TTC-23 from Truck. To unload the AN/TTC-23 from a truck, reverse the procedures given in *a* and *b* above.

2-4. Grounding

Warning: The AN/TTC-23 must be properly grounded before input power is connected.

Select a grounding site (within 6 feet of the power entrance panel) that is low and damp, if possible, and will not interfere with the entrance door, field wires, power, or signal cables.

a. Loosen and lift the cover of the power entrance panel (fig. 1-11).

b. Use the cover support to secure the cover in the open position.

c. Remove the ground rod and the sledge hammer from their mountings in the shelter.

d. Remove any dirt or grease from the ground rod.

e. Scoop out a small hole, about 6 inches deep, at the selected grounding site.

f. Drive the ground rod into the hole until the top of the ground rod is approximately 3 inches above the bottom of the hole.

g. Remove the 10-foot ground strap from the shelter storage area.

h. Connect one end of the ground strap to the ground rod and the other end to the ground terminal in the power entrance panel.

i. Saturate the ground around the rod with water to keep the site moist.

j. If a generator set is used to supply ac power, ground it the same way as the AN/TTC-23.

2-5. Power Connections

Ac power for the AN/TTC-23 may be obtained from a generator, a central power source, or from a commercial power source.

Warning: The AN/TTC-23 must be grounded before power is connected.

a. Preliminary Procedures. Before making power connections, proceed as follows:

(1) Make sure that all circuit breakers and equipment power switches are at OFF.

(2) Remove the power cable assembly and cable reel from the shelter (fig. 1-4).

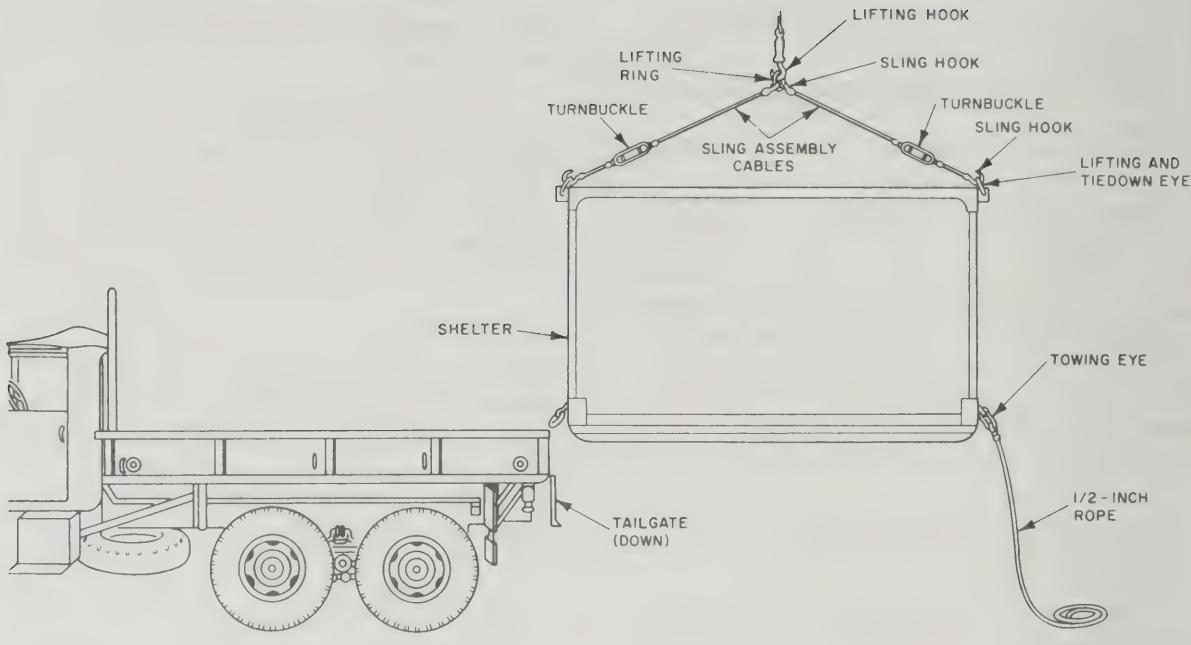


Figure 2-2. Lifting and loading AN/TTC-23 on truck.

(3) Unwind the power cable assembly and power cable stub from the cable reel.

Caution: Power for the AN/TTC-23 is normally supplied through the IN POWER 115V AC connector. The POWER 115V AC OUT connector is provided to supply power to another shelter or to supply power to the AN/TTC-23 if the IN POWER 115V AC connector is damaged. When the POWER 115V AC OUT connector is used to supply power to another shelter, do not allow the total current drain to exceed 60 amperes (current rating of power cable assembly between the AN/TTC-23 and power source).

b. Connection to Generator Set. If a generator set is used to provide power to the AN/TTC-23, connect power to the shelter as follows:

(1) Remove the cover from the IN POWER 115V AC receptacle on the power entrance panel (fig. 1-11) and from the power cable assembly. Connect the power cable assembly to the IN POWER 115V AC receptacle.

(2) If the generator set includes an output connector that is compatible with the connector on the power cable assembly, connect the power cable assembly to the generator set; otherwise, refer to the generator set technical manual and connect the leads (white lead neutral) of the power cable stub

to the appropriate output terminals of the generator set. Connect the power cable stub to the power cable assembly.

c. Connection to Commercial Power.

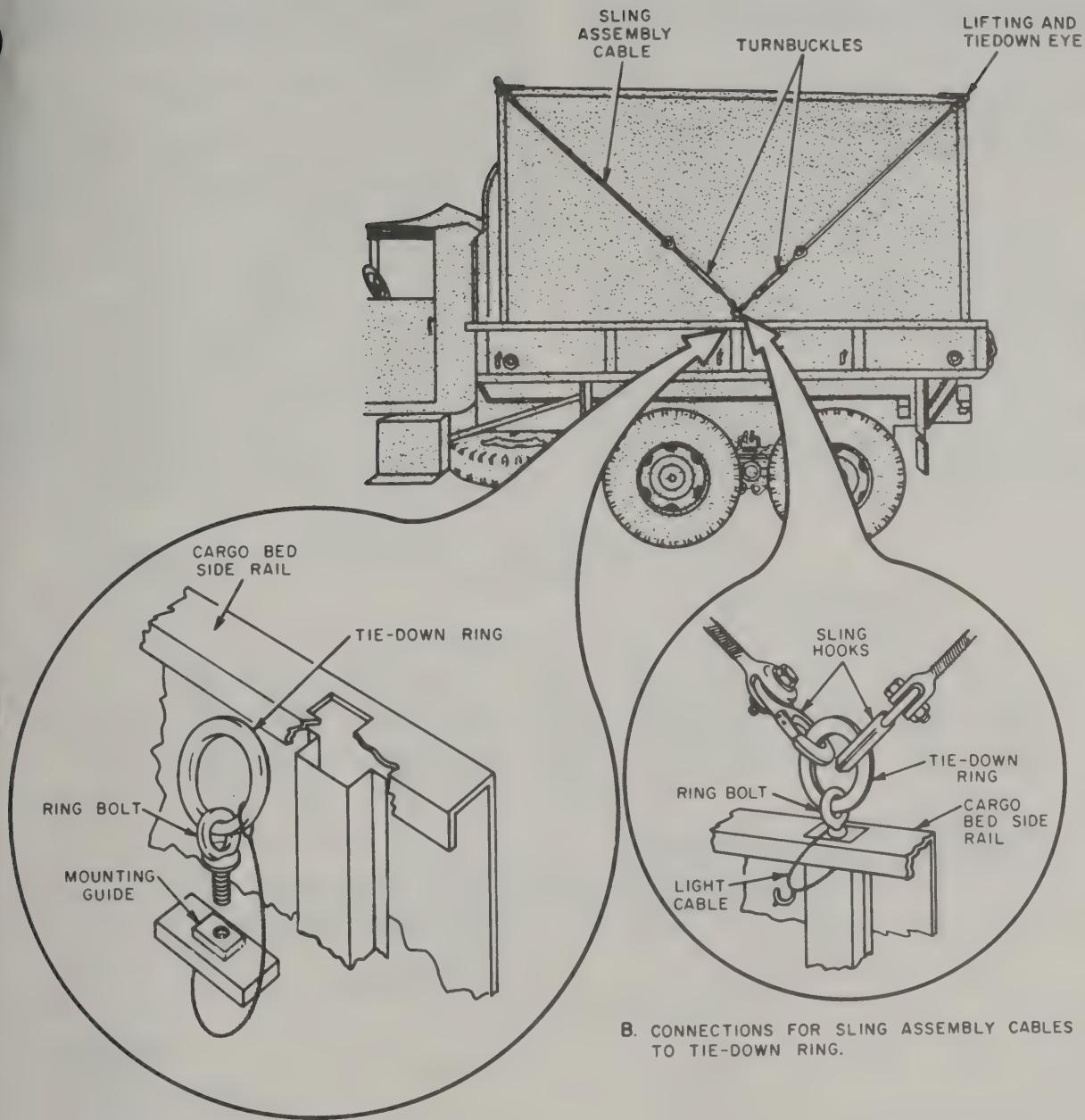
(1) Turn off or disconnect the commercial power source before making any connections.

(2) If the power source is a 120-volt, 50- to 60-Hz, single-phase, two-wire source, connect the green and white wires of the power cable stub to the neutral terminal, and the black wire of the power cable stub to the other terminal.

(3) If the power source is a 110/220-volt, 50- to 60-Hz, single-phase or 2-phase, 3-wire distribution system, connect the green and white wires of the power cable stub to the neutral terminal, and the black wire to either of two other terminals.

(4) If the power source is a 110/220-volt, 50- to 60-Hz, 3-phase, 4-wire distribution system, connect the green and white wires of the power cable stub to the neutral bus bar, and the black wire of the power cable stub to the phase 1, phase 2, or phase 3 bus bar.

(5) Connect the power cable stub to one end of the power cable assembly. Connect the other end of the power cable assembly to the IN POWER 115V AC receptacle on the AN/TTC-23 power entrance panel (fig. 1-11).



A. EXPLODED VIEW OF TIE-DOWN RING ASSEMBLY.

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Figure 2-3. Securing AN/TTC-23 on truck.

(6) Turn on or connect the commercial power.

2-6. Signal Connections

All telephone and intercommunication connections are made through the AN/TTC-23 signal entrance panel (fig. 1-12). The mounted 26-pair cable receptacles on SIGNAL 1 through 5 provide 2-wire telephone circuits.

The SIGNAL 6 receptacles provides 4-wire circuits to the distant end CV-1548/G through radio/wire transmission media. The odd numbered pairs on the 26-pair cable are receive loop, and the even numbered pairs are transmit loop.

a. Twenty-Six-Pair Cable Connection Procedure.

(1) Unlock and remove the covers from the 26-pair cable assembly and on the 26-pair receptacle in the signal box (fig. 1-12).

(2) Insert the connector into the receptacle and secure it by closing the locking collar.

(3) If the required cable distance exceeds 250 feet, couple two 26-pair cable assemblies together.

NOTE

To avoid poor quality signals, do not connect more than six 26-pair cable assemblies together.

b. Field Wire Connection Procedure. Connect the field wires to the PHONE and INTERCOM and INFO PHONE binding posts in the signal entrance box (fig. 1-12) as follows:

(1) Loosen the captive screws and lift the signal entrance box cover.

(2) Depress the binding post to open the wire slots. Place the field wires in the appropriate slots and release the binding posts.

(3) Check each wire to be sure that it is securely fastened and that the wire insulation is not caught in the binding post slot.

2-7. Installing Cross-Connections

The main distribution frames (MDF-1 and MDF-2) provide flexibility of traffic load on the switchboard. MDF-1 is used for SIGNAL 1 through 5 connectors; each signal connector providing 20 telephone circuits (2-wire service). MDF-2 is used for interconnect of Converter Telephone Signal CV-1548/G (2-wire service) to Telephone Circuits, Trunk Relay TA-276/TTC.

a. MDF-1 Cross-Connection Procedure.

(1) Press the binding posts to open the wire slots. Place the jumper wires in the appropriate slots and release the binding posts. Jumper wires are interconnected from LINE binding posts to SWITCHBOARD binding posts (fig. 2-4). Be sure that the T(tip) jumper wire on the LINE binding post is connected to the T(tip) on the SWITCHBOARD binding post.

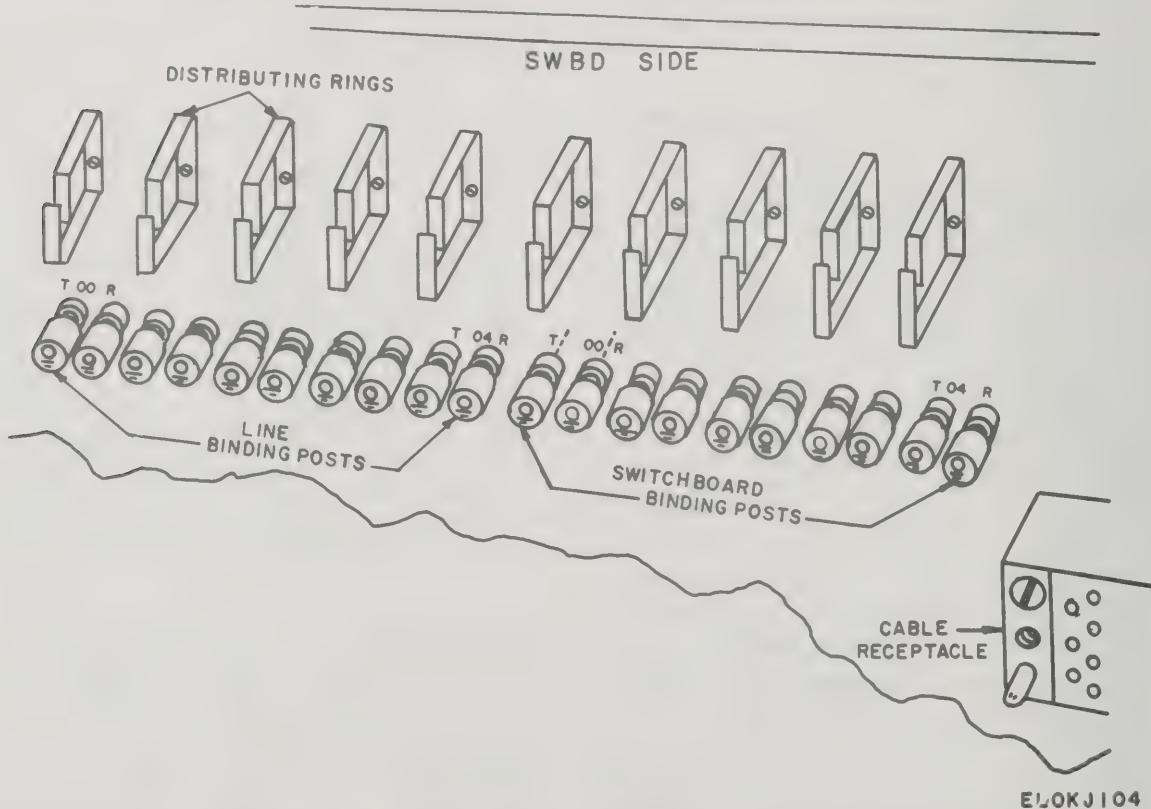


Figure 2-4. Main Distribution Frame, Telephone TA-454/GTA-14(V), cross-connection binding posts.

(2) Standard hook-up of jumper wires on MDF-1 are from LINE binding posts to SWITCHBOARD binding posts on the same call-out; i.e., 00(LINE) to 00(SWITCHBOARD), 01(LINE) to 01(SWITCH-

BOARD), etc.

b. MDF-2 Cross-Connection Procedure.

(1) Connect jumper wires as outlined in figure 2-5. Be sure the jumper wires are connected from T(tip)

LINE binding post to T(tip) SWITCHBOARD binding post and R(ring) LINE binding post to R(ring) SWITCHBOARD binding post.

(2) Check the CH-1 through CH-12 2W-4W

switches located on the front panel of Converter, Telephone Signal CV-1548/G. These switches should be in the 2W position.

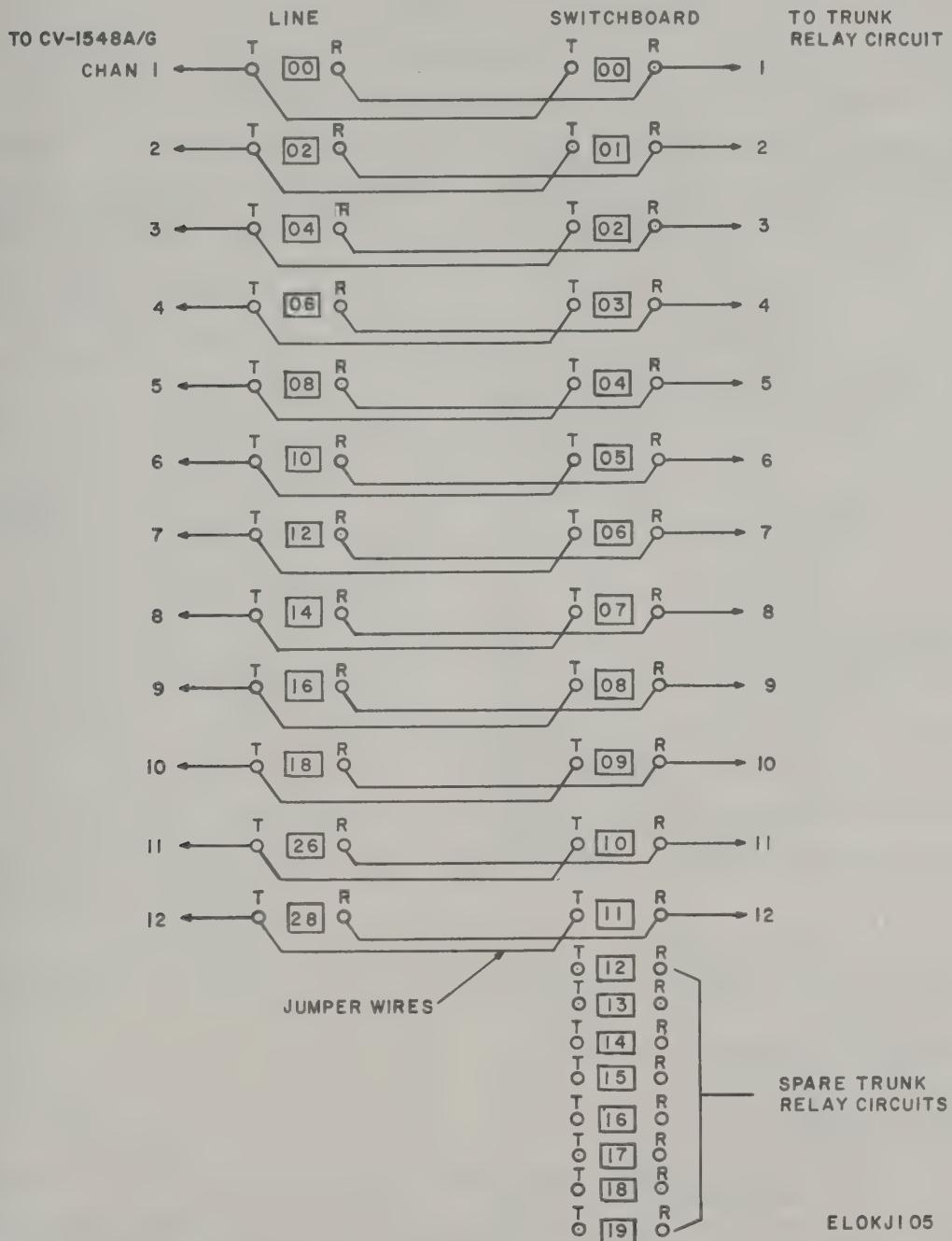


Figure 2-5. MDF-2 cross-connections for CV-1548/G and Telephone Circuit Trunk Relay TA-276/TTC.



CHAPTER 3

OPERATION

3-1. General

The following are the descriptions of the controls and indicators of Central Office, Telephone,

Manual AN/TTC-23. For information concerning the controls and indicators of the major components, refer to the applicable technical manuals listed in appendix A.

a. Power Distribution Panel (fig. 3-1).

Control or indicator	Description and function	
MAIN circuit breaker	Two 60-ampere internally ganged circuit breakers. Provides on-off control and overload protection for a 115-volt, ac power supply to individual circuit breakers.	
Individual circuit breakers	Provide on-off control and overload protection for individual circuits as follows:	
Circuit breakers:	Rating (amperes)	Circuit
1 LIGHTS	15	Fluorescent lights.
2 HEATER 1	20	Electric heater power receptacle HEATER 1.
3 HEATER 2	20	Electric heater power receptacle HEATER 2.
4 AIR COND.	20	Air conditioner receptacle.
5 EQUIP	15	Major equipment receptacles.
6 BLOWER, CONV. INTERCOM	20	Blower, convenience, and intercom receptacles.
Ammeter	Ac ammeter with 0- to 100- ampere scale. Indicates total current drain from external power supply by AN/TTC-3 components in use.	
Voltmeter	Ac voltmeter with 0- to 150-volt scale. Indicates ac input voltage from external power source.	
Glowlamps (6)	Neon lamp. Glows when associated circuit breaker is at ON.	

b. Lighting (figs. 1-5 and 1-6).

Control or indicator	Description and function	
BLACKOUT BYPASS switch (fig. 1-5)	Two position ON-OFF switch. Controls all lighting in the AN/TTC-23 for blackout operation as follows:	
	Sw pos	Function
ON		Permits fluorescent lights to be controlled by the individual light switches.
OFF		Permits fluorescent lights to be controlled by door microswitch.
Door microswitch	Extinguishes fluorescent lights when door is opened. (BLACKOUT BYPASS switch at OFF).	
POWER INDICATOR NEON LAMP	Lights when ac power is connected to the AN/TTC-23.	
FLUORESCENT LIGHTS switch	Two-position ON-OFF switch. Controls all fluorescent lights in the AN/TTC-23.	
COLD START INCANDESCENT LIGHTS switch	Two-position ON-OFF switch. Controls cold start incandescent lights.	
NIGHTLIGHT switch (fig. 1-6)	Two-position ON-OFF switch. Controls wire chief's night-light.	

c. Equipment (figs. 1-5 and 1-7).

Control or indicator	Description and function
BAT. EXHAUST FAN switch (fig. 1-5)	Two-position ON-OFF switch. Controls the battery exhaust fan.
BLOWER switch (fig. 1-7)	Two-position ON-OFF switch. Controls the blower.
Thermostat (fig. 1-7)	Controls the temperature inside the AN/TTC-23 when the air conditioner is on.

d. Electric Heaters (fig. 1-4).

Control	Description and function	
HEAT-OFF-FAN switch	Three-position toggle switch.	
	Sw pos	Function
	HEAT	Applies ac power to heater element and fan motor.
	OFF	Disconnects ac power from heater element and fan motor.
	FAN	Applies ac power to fan motor.
TEMPERATURE CONTROL	Thermostat control. Regulates the temperature provided by the heating element.	

e. Information Turret (fig. 3-2).

Control or indicator	Description and function	
LINE 1 and LINE 2 NORMAL-TALK-HOLD switch (2)	Three-position, bent-handle switch.	
	Sw pos	Function
	NORMAL	Disconnects telephone from line and connects CALL lamp to line.
	TALK	Disconnects CALL lamp from line and connects telephone set to line.
	HOLD	Disconnects telephone set from line and connects HOLD lamp to line.
CALL lamp (2)	Glowlamps. Light to indicate an incoming call.	
HOLD lamp (2)	Incandescent lamps. Light when associated line is in the hold condition.	

f. Air Conditioner (fig. 3-3).

Control or indicator	Description and function	
OFF-FAN-COOL selector switch		
	Sw pos	Function
	OFF	Disconnects ac power from compressor motor and fan.
	FAN	Applies ac power to fan motor.
	COOL	Applies ac power to compressor motor.
THERMOSTAT	Thermostat control. Regulates the temperature provided by selector switch setting.	
FRESH AIR control	Controls intake of fresh air to the shelter interior.	

3-2. Energizing Ac Circuits

Warning: To prevent asphyxiation, the shelter must be ventilated at all times when occupied. Prepare the AN/TCC-23 for full operation as follows:

a. Connect the AN/TTC-23 to the available power source (paras 2-4 and 2-5); the POWER INDICATOR NEON LAMP (fig. 1-5) will light.

b. Operate the power distribution panel MAIN circuit breaker switch (fig. 3-1) to ON.

c. Operate the BLACKOUT BYPASS switch (fig. 1-5) to ON. When blackout conditions are required, operate the switch to OFF.

d. Operate circuit breaker switch No. 1 (LIGHTS) to ON.

e. Operate FLUORESCENT LIGHTS switch (fig. 1-5) to ON. Operate COLD START INCANDESCENT LIGHTS switch (fig. 1-5) to ON, as required.

f. Check to see that the voltmeter (fig. 3-1) indicates 105 to 125 volts ac. If indicated voltage is

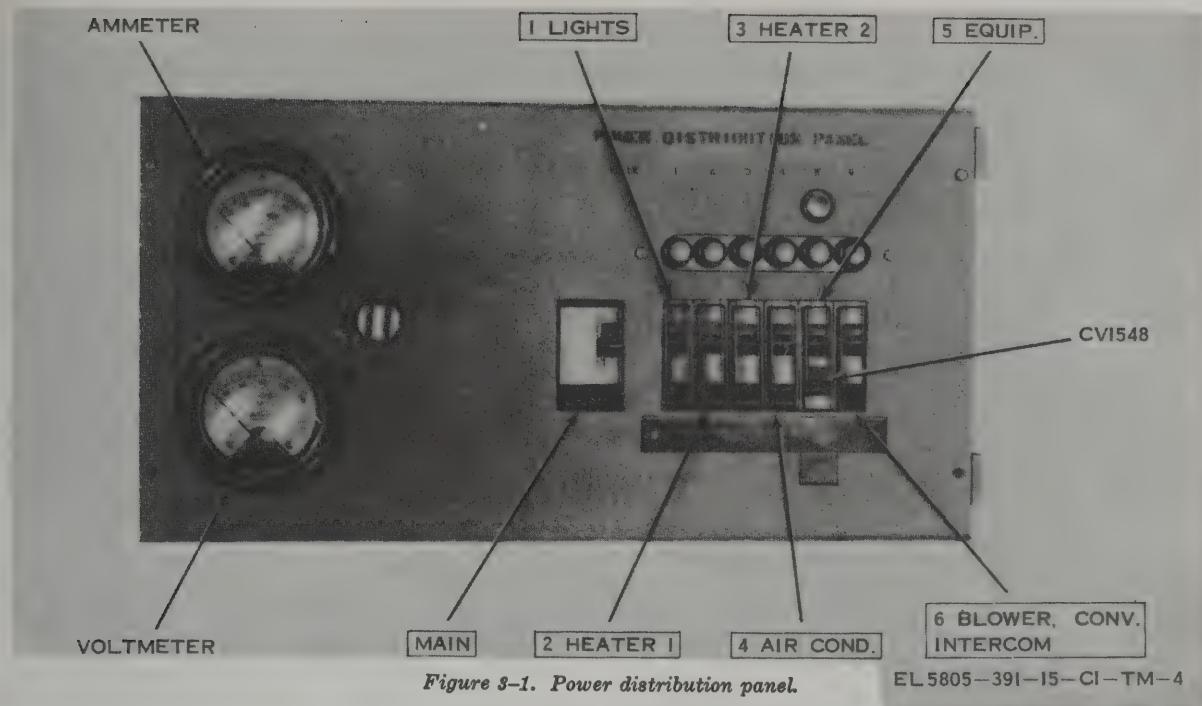
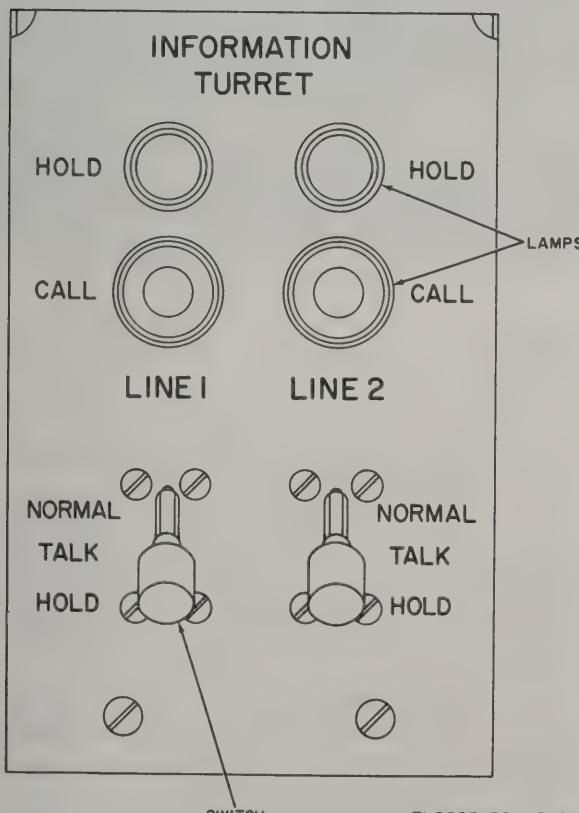


Figure 3-1. Power distribution panel.

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EL 5805-391-15-25

Figure 3-2. Central Office, Telephone, Manual AN/TCC-23 information turret.

outside these limits, follow the procedures outlined in paragraph 4-5.

g. Check to see that the ammeter (fig. 3-1) indicates approximately 0 ampere. If a higher current reading is obtained, verify circuit breakers 2 through 6 are at OFF. If circuit breakers are at OFF, refer to paragraph 4-5.

h. Operate circuit breakers 2 through 6 to ON.

3-3. Operating Procedures

Note. Refer to the applicable technical manuals listed in appendix A for operating procedures of major components. Refer to paragraph 3-1 for descriptions and functions of controls and indicators of AN/TTC-23 components.

Warning: To prevent asphyxiation, the AN/TTC-23 must be ventilated at all times when occupied.

a. Electric Heaters (fig. 1-14).

(1) Insert the power connector cord plug into the appropriate HEATER receptacle.

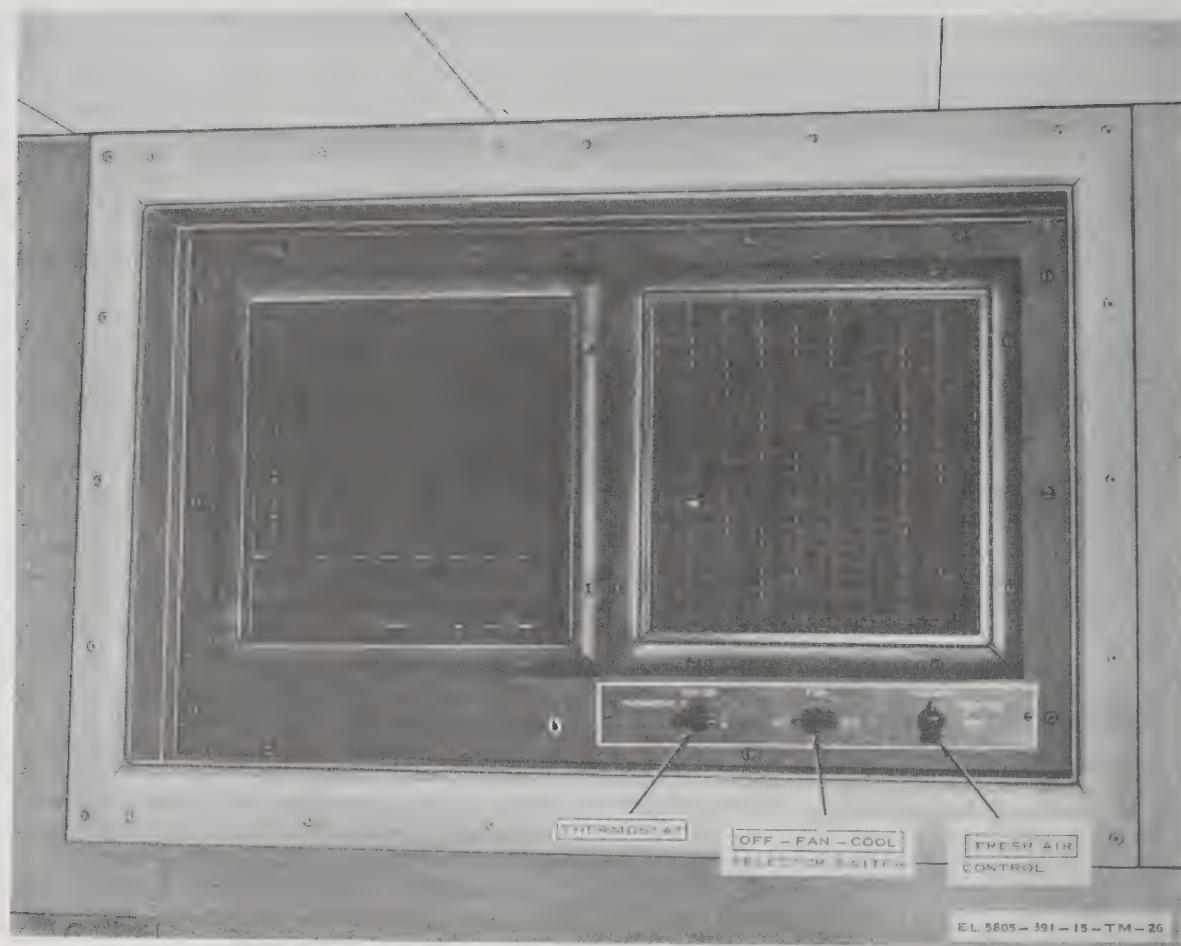
(2) Operate the HEAT-OFF-FAN switch to the desired position.

(3) If the HEAT-OFF-FAN switch is operated to HEAT, set the TEMPERATURE CONTROL to the desired setting.

b. Exhaust Blower.

Note. If blower is in stowed position, remove and replace outside (para 4-18).

(1) Open the air vent cover on the shelter door (fig. 1-5) and the exhaust vent cover on the



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Figure 3-3. Air conditioner.

blower inclosure (fig. 1-2) before operating the blower.

(2) Operate the BLOWER switch (fig. 1-7) to ON.

c. Intercommunication Station LS-147C/FI (fig. 1-10).

(1) Operate the OFF-SEND switch to 5 (approximately midposition). The glowlamp will light.

(2) Operate the PRESS TO TALK switch and speak into the speaker-microphone on the intercommunication panel; release the PRESS TO TALK switch to receive.

Note. The OFF-SEND switch does not have to be turned on to receive a call.

(3) Operate the RECEIVE control to regulate the volume of incoming calls.

d. Information Turret (fig. 3-2).

Note. When not in use, both switches on the information turret must be at NORMAL.

(1) When a CALL lamp lights, operate the associated HOLD-TALK-NORMAL switch to TALK and answer on the INFO-PHONE TA-312/PT. The CALL lamp will be extinguished when the HOLD-TALK-NORMAL switch is operated.

(2) When it is necessary to hold a call, operate the associated HOLD-TALK-NORMAL switch to HOLD. The HOLD lamp will light.

(3) To complete the call on HOLD, operate the associated HOLD-TALK-NORMAL switch from HOLD to TALK. The HOLD lamp will be extinguished. When a call is completed, operate

the HOLD-TALK-NORMAL switch to NORMAL.

e. Air Conditioner (fig. 3-1).

(1) *Service valve operations.* Operate refrigerant service valves to the proper position as indicated in the air conditioner operating literature.

Caution: Both refrigerant service valves must be operated before operating air conditioning unit.

(2) *Connecting power cable.* Remove the power cable from the shelter storage cabinet. Connect the female receptacle to the mating "twist-lock" receptacle on the unit, twist the receptacle to lock it in place. Connect the male connector to the exterior weatherproof receptacle mounted on the upper front curbside of the shelter (fig. 1-15).

(3) Turn the air conditioner selector switch to COOL.

(4) Turn the THERMOSTAT control knob to extreme right (in the direction of the arrow) until the compressor starts. Readjust the THERMOSTAT control as required to satisfy cooling requirements.

(5) Turn the FRESH AIR CONTROL to OPEN if outside air is desired.

f. Battery Exhaust Fan.

(1) Open the battery exhaust fan vent cover on the outside of the shelter (fig. 1-1).

(2) Insert the power connector cord plug into the BAT. EXHAUST FAN receptacle (fig. 1-5).

(3) Operate the BAT. EXHAUST FAN switch to ON (fig. 1-5).

g. CV-1548/G

Operate the AC POWER switch on the CV-1548/G to ON position.

3-4. Stopping Procedures

Note. To turn off the power in an emergency, operate the MAIN circuit breaker switch to OFF.

Stopping procedures are not required for the TA-312/PT. Refer to the applicable technical manuals listed in appendix A for stopping on the major components.

a. Electric Heaters. Operate the TEMPERATURE CONTROL to its lowest setting and the HEAT-OFF-FAN switch to OFF.

Note. After the other AN/TTC-23 components have been turned off, allow the exhaust blower to remain in operation for at least 10 minutes to evacuate all smoke and fumes before completing the stopping procedures and closing the shelter door.

b. Blowers. Operate the BLOWER switch and BAT. EXHAUST FAN switch to OFF. Secure the blower vents.

c. Air Conditioner (fig. 3-3).

(1) Operate the selector switch to OFF.

(2) Operate the FRESH AIR CONTROL to CLOSED.

d. Circuit Breaker and Light Switches. Operate all circuit breakers and light switches to OFF.

e. Door and Entrance Panel Covers. Secure the shelter door and the power and signal entrance panel covers.

f. CV-1548/G

Operate the AC POWER switch on the CV-1548/G to OFF position.

3-5. Operating Under Unusual Climatic Conditions

The AN/TTC-23 can be operated in extremely cold or hot climates. The shelter offers complete protection from the elements for personnel and equipment. However, when the power and signal entrance panels are exposed to adverse conditions, the following precautions are necessary:

a. Cold Climates. Extreme cold causes the cables and wires to become hard, brittle, and difficult to handle. Be careful when handling the cables and when connecting them to the AN/TTC-23 so that kinks and unnecessary loops will not result in permanent damage. Make sure that the binding posts and cable receptacles on the outside of the AN/TTC-23 are free of frost, snow, and ice by replacing the covers on the receptacles and closing the covers on the signal and power entrance panels when they are not in use. Lower and secure the folding side panels when the entrance panel covers are open. Replace the connector covers as soon as the connectors are disconnected from the equipment; never drag or place an open connector in snow or on the ground.

b. Hot, Dry Climates. In hot, dry climates, the 26-pair connectors and receptacles and the binding posts are subject to damage from dirt and dust. Lower and secure the folding side panels when the entrance panel covers are open. Close the entrance panel covers when they are not in use, and replace the covers on the cable connectors. Never drag or place an open connector on the ground.

c. Warm, Damp Climates. In warm, damp climates, the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the exterior of the equipment with a lint-free cloth.



CHAPTER 4

MAINTENANCE

Section I. OPERATOR/CREW AND ORGANIZATIONAL MAINTENANCE

4-1. Scope of Operator/Crew and Organizational Maintenance

a. Operator/Crew preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to maintain the equipment in serviceable condition. To be sure that your Telephone Manual Central Office AN/TTC-23 is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS).

(1) BEFORE OPERATION, perform your B PMCS to be sure that your equipment is ready to go.

(2) DURING OPERATION, perform your D PMCS. This should help you spot small troubles before they become big problems.

(3) AFTER OPERATION, perform your A PMCS. This should help you keep your equipment in top shape.

(4) WEEKLY AND MONTHLY PMCS are important checks you make to keep serious problems from suddenly happening. Perform WEEKLY as well as BEFORE OPERATION PMCS if:

(a) You are assigned operator and have not operated the item since the last WEEKLY.

(b) You are operating the item for the first time.

(5) When an item of equipment is reinstalled after removal for any reason, perform the necessary B PMCS, paragraph 4-2, to be sure the item meets the readiness reporting criteria.

(6) Use the Item No. column in the PMCS table to get the number to be used in the TM Item No. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.

b. Organizational preventive maintenance procedures are designed to help maintain equipment in serviceable condition. They include what items should be checked and how to check them. These checks and services described in paragraph 4-3, outline inspections that are to be made at specific (W) weekly, (M) monthly, (Q) quarterly (S) semiannually and (A) annual intervals.

c. Routine checks like cleaning, dusting, washing, checking for frayed cables, stowing items not in use, covering unused receptacles and checking for loose nuts and bolts are not listed as PMCS checks. They are things that you should do anytime you see they must be

done. If you find a routine check like one of those listed, in your PMCS, it was listed because other operators reported problems with this item.

WHEN YOU ARE DOING ANY PMCS OR ROUTINE CHECKS, KEEP IN MIND THE WARNINGS AND CAUTIONS.

WARNING

Never operate the generator or shelter until it has been properly grounded. Electrical defects in the load lines or equipment can cause death by electrocution when contact is made with an ungrounded system.

Never operate the generator in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death.

The fumes of TRICHLOROTRIFLUOROETHANE are toxic. Provide thorough ventilation whenever it is used; avoid prolonged or repeated breathing of vapor. Do not use near an open flame or hot metal surface; TRICHLOROTRIFLUOROETHANE is nonflammable but heat converts the fumes to highly toxic phosgene gas the inhalation of which could result in serious injury or death. Prolonged or repeated skin contact with TRICHLOROTRIFLUOROETHANE can cause skin inflammation. When necessary, use gloves, sleeves and aprons which the solvent cannot penetrate.

Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent a chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel. Compressed air shall not be used for cleaning purposes except where reduced to less than 29 psi and then only with effective chip guarding and personal protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used.

CAUTION

It is of foremost importance that there be free

circulation of air around the generator sets at all times during operation. Inadequate ventilation is a major cause of damage to the equipment. Place all tags describing condition of the trailer in a conspicuous location so that they will not be overlooked.

NOTES

The PROCEDURES column in your PMCS charts instruct you how to perform the required checks and services. Carefully follow these instructions and if tools are needed or the

chart instructions tell you, get organizational maintenance to do the necessary work.

If your equipment must be in operation all the time, check those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

d. Deficiencies that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of preventive maintenance must be made in accordance with procedures given in TM 38-750.

4-2. Operator/Crew Preventive Maintenance Checks and Services

NOTE

The checks in the interval column are to be performed in the order listed.

Item No.	Interval				Item to be Inspected	Procedures	For readiness reporting equipment is not ready/available if:
	B	D	A	W			
1					Central Office, Telephone, Manual AN/TTC-23.	Check and have repaired or adjusted as necessary	Insufficient equipment is available to support the mission.
2					AN/TTC-23 Operation.	<p>Originate a call on switchboard. Communications shall operate normally.</p> <p>a. Be alert for unusual noises or improper operation of brakes, swivel easier with hub or retractable support, and leveling jacks.</p> <p>b. Investigate and correct or report any faults noted during operation.</p> <p>c. Inspect suspension system and associated mounting parts for damage.</p> <p>d. Remove pipe plug from bottom of air filter, drain filter, and install plug.</p>	If all communications are down — all lines.

4-3. Organizational Preventive Maintenance Checks and Services

M - Monthly
Q - Quarterly

The checks in the interval column are to be performed in the order listed.

Item No.	Interval		Item	Procedures
	M	Q		Check and have repaired or adjusted as necessary.
1.	*		Fire extinguisher.	<p>a. Refill if weight of contents is less than prescribed, or if seal is broken.</p> <p>b. Replace if valve assembly is damaged.</p>
2.	*	*	First aid kit.	<p>a. Replace if case is broken or damaged.</p> <p>b. Replace parts that have been used (See parts list sheet inside first aid kit.)</p>
	*		Fuses.	See that all operating fuses are of correct value.

4-4. Deleted

4-5. Shelter Facility Troubleshooting

a. General. Replacement and repair of components and parts for the AN/TTC-23 are authorized for the various levels of maintenance personnel as indicated in section II of the maintenance allocation chart (app C). The tools and test equipment required are listed in section III of the maintenance allocation chart. Troubleshooting information in the troubleshooting chart (*b* below) is based on symptoms that would be obtained while performing the operator's daily preventive maintenance checks and services (para 4-2) and organizational monthly preventive maintenance checks

and services (para 4-3). For signal line and power-line troubleshooting information, refer to the signal circuits schematic-wiring diagram (fig. 6-1), the switchboard intercomponent cabling diagram (fig. 6-2), and the power schematic-wiring diagram (fig. 6-3). When an abnormal symptom is obtained, locate the symptom in the troubleshooting chart and perform the corrective measure indicated, as authorized in the maintenance allocation chart. If the corrective measure does not correct the problem, refer to higher category maintenance. For trouble shooting procedures for the major components, refer to the applicable technical manual listed in appendix A.

b. Troubleshooting.

Item No.	Symptom	Probable trouble	Corrective measures
1-----	POWER INDICATOR NEON LAMP fails to glow when power is applied to AN/ TTC-23.	<ul style="list-style-type: none"> a. Defective lamp. b. Defective power cable. c. Defective IN POWER 115V AC receptacle. <p><i>Note. If immediate operation is required, and POWER 115V AC OUT receptacle is not used to power another assemblage, use POWER 115V AC OUT receptacle for input power.</i></p>	<ul style="list-style-type: none"> a. Replace lamp. b. Check and repair or replace as required (para 4-11). c. Check and repair or replace as required (para 4-11).
2-----	Ac voltmeter indicates 0 volt when power is applied and MAIN circuit breaker is operated to ON.	<ul style="list-style-type: none"> a. Defective MAIN circuit breaker. b. Defective voltmeter. c. Defective power cable. 	<ul style="list-style-type: none"> a. Replace circuit breaker (para 4-10). b. Replace meter. c. Repair or replace cable (para 4-11).
3-----	Neon lamp fails to glow when associated circuit breaker is operated to ON.	<ul style="list-style-type: none"> a. Defective neon lamp. b. Defective circuit breaker on power distribution panel. 	<ul style="list-style-type: none"> a. Replace neon lamp. b. Replace circuit breaker (para 4-10).
4-----	Fluorescent ceiling lights do not operate when FLUORESCENT LIGHTS switch is operated to ON.	<ul style="list-style-type: none"> a. Defective BLACKOUT BYPASS switch b. Defective LIGHTS circuit breakers on power distribution panel. c. Defective light. 	<ul style="list-style-type: none"> a. Replace switch (para 4-12). b. Replace circuit breaker (para 4-10).
5-----	Incandescent ceiling lamp does not light when COLD START INCANDESCENT LIGHTS switch is operated to ON.	<ul style="list-style-type: none"> a. Defective cold start incandescent light switch. b. Defective fixture or wiring. c. Defective lamp. 	<ul style="list-style-type: none"> c. Replace light. a. Replace switch (para 4-12).
6-----	Ceiling lights are not extinguished when door is opened and BLACKOUT BYPASS switch is at OFF.	<ul style="list-style-type: none"> a. Defective door microswitch. b. Defective BLACKOUT BYPASS switch. 	<ul style="list-style-type: none"> b. Check and repair or replace as required (fig. 6-3). c. Replace lamp. a. Replace switch (para 4-12). b. Replace switch (para 4-12).
7-----	Exhaust blowers fail to operate when blower switches are operated to ON.	<ul style="list-style-type: none"> a. Defective exhaust blower. b. Defective exhaust BLOWER switch or receptacle. 	<ul style="list-style-type: none"> a. Check and repair or replace as required (figs. 4-16 and 4-19). b. Check and replace as required (para 4-12).
8-----	Heater fails to operate properly.	<ul style="list-style-type: none"> a. Defective heater receptacle. b. Defective heater. c. Defective heater circuit breakers on power distribution panel. d. Defective ac wiring. 	<ul style="list-style-type: none"> a. Check and replace as required. b. Check and replace as required. c. Replace circuit breakers (para 4-10). d. Check and repair as required (fig. 6-3).

Item	Symptom	Probable trouble	Corrective measures
9	No ac power available from any CONVENIENCE receptacle.	Defective circuit breaker on power distribution panel	Replace circuit breaker (para 4-10).
10	No ac power to air conditioner.	a. Defective equipment receptacle. b. Defective equipment circuit breaker on power distribution panel. c. Defective ac wiring.	a. Check and replace as required. b. Check and replace as required (para 4-10).
11	No ac power to equipment.	a. Defective equipment receptacle. b. Defective equipment circuit breaker on power distribution panel. c. Defective ac wiring.	c. Check and repair or replace as required (fig. 6-3). a. Check and replace as required.
12	Local communication not available with LS-147C/F1.	a. Defective LS-147C/F1. b. Defective wiring in signal duct. c. Defective connector.	b. Check and replace as required (para 4-10). c. Check and repair as required (fig. 6-3). a. Check and repair or replace as required.
13	Local communications not available with TA-312/PT.	a. Defective TA-312/PT. b. Defective wiring in signal duct. c. Defective connector.	b. Check and repair or replace as required (fig. 6-1). c. Check and repair or replace as required. a. Check and repair or replace as required. b. Check and repair or replace as required (fig. 6-1). c. Check and repair or replace as required.
14	Ammeter indicates current flow when circuit breakers 2 through 7 are at OFF.	Note. For trouble-shooting procedures of major components, refer to applicable technical manual (app A).	a. Repair or replace as required (para 4-10). b. Disconnect all ac input power and check for grounded or shorted wiring (fig. 6-3). c. Repair or replace as required (para 4-10).
15	Switchboard operator indicates loss of a specific channel or only one-way communication on a specific channel. All other indicators are normal.	a. Defective circuit breakers. b. Defective ac wiring.	a. Troubleshoot CV-1548/G. b. Check and replace if necessary. c. Check and repair as required.
16	Switchboard operator indicates that no signaling is available on any 2-wire channel.	Defective CV-1548/G.	Troubleshoot CV-1548/G.
17	Power indicator does not light when POWER switch is operated to ON.	a. Defective power cable. b. Defective 1/2A SB fuse.	a. Check and repair or replace as required. b. Replace 1/2A SB fuse.
18	No channel provides proper signaling.	a. Defective power supply assembly 18A1.	a. Replace power supply 18A1.
19	No communication through a specific channel.	b. Defective panel 18A2. a. Defective line connections.	b. Replace panel 18A2. a. Check and replace or repair as required.
20	Specific channel does not indicate incoming call signal.	b. Defective associated panel 18A3 or 18A4.	b. Replace associated panel 18A3 or 18A4.
21	Distant terminal indicates that a specific channel does not indicate incoming call signal.	Defective associated panel 18A3 or 18A4.	Replace associated panel 18A3 or 18A4.
		Replace associated panel 18A3 or 18A4.	

Section II. OPERATOR'S REPAIR PROCEDURES

4-6. Replacement of Hand Lantern Batteries and Bulb

The hand lantern requires four Batteries BA-30 which are not supplied. A spare bulb is stored behind the reflector.

a. Inserting Batteries.

(1) Pull the latch forward and raise the battery case cover.

(2) Insert all four cells and the center brass caps up.

(3) Snap the battery case cover shut.

b. Replacing Bulb.

(1) Press in on the button and lift out the reflector.

(2) Unscrew the brass cap at the rear of the bulb and remove the bulb and spring.

(3) Remove the spare bulb from inside the reflector case. Insert the bulb and spring in the reflector and tighten the brass insert.

(4) Replace the reflector in the reflector case and snap it securely in position.

4-7. Remove and Replacement of Lamps and Starters

a. Fluorescent Lamp.

(1) Pull gently to remove the light shield from the fluorescent light fixture.

(2) Rotate the lamp in its sockets one-quarter turn and remove it from the fixture.

(3) Remove a spare lamp from its storage brackets.

(4) Align the pins on each end of the lamp with the slots in the fixture sockets.

(5) Press in and rotate the lamp one-quarter turn to seat the pins firmly.

(6) Replace the light shield on the fluorescent light fixture.

b. Fluorescent Lamp Starter.

(1) Remove the lamp (a(1) and (2) above) to expose the starter.

(2) Press in and twist the starter one-quarter turn counterclockwise, and withdraw it.

Section III. ORGANIZATIONAL REPAIR PROCEDURES

4-10. Power Distribution Panel Repairs

(fig. 6-3)

WARNING

Before performing any power distribution panel repairs, disconnect the power cable from the IN POWER 115V AC receptacle in the power entrance panel.

(3) Remove the spare starter from its storage bracket. Insert the new starter, press in, and turn clockwise until it seats.

(4) Replace the lamp and light shield (a(4), (5), and (6) above).

c. *Neon and Incandescent Lamps.* To remove a defective neon or incandescent lamp, unscrew it from its socket.

4-8. Removal and Replacement of Intercommunication Station LS-147C/F1 (fig. 1-10)

a. Remove the power cord connector plug from the INTERCOM receptacle in the power duct.

b. Disconnect the signal cord plug from the INTERCOM jack.

c. Loosen the captive wingnuts and slide the retaining bracket forward.

d. Lift the LS-147C/F1 from the shelf.

e. Replace the LS-147C/F1 by following the procedures in a through d in reverse order.

4-9. Removal and Replacement of the Telephone Set TA-312/PT

(fig. 1-10)

a. Remove the prepared leads from the TA-312/PT binding posts.

b. Loosen the wingnut on the side of the mounting bracket and rotate the clamping arm upward.

c. Remove the flathead screw on the side of the mounting bracket.

d. Lift the TA-312/PT out of the mounting bracket and remove the holding plate from the buzzer recess.

e. Remove the replacement TA-312/PT from its carrying case, and place the TA-312/PT into the mounting bracket.

f. Replace and tighten the flathead screw.

g. Operate the LB-CB-CBS switch to CB.

h. Position the clamping arm over the handset and tighten the wingnut.

i. Connect the prepared leads of the telephone cord to the TA-312/PT binding posts.

a. *Preliminary Procedures.* Remove the screws that secure the cover to the power distribution panel and remove the cover (fig. 1-13).

b. *Removal and Replacement of Circuit Breaker.*

(1) Grasp the defective circuit breaker and pull it straight out from the panel.

(2) Disconnect the wires connected to the circuit breaker.

(3) Connect the wires to the appropriate terminals of the replacement circuit breaker.

(4) Position the circuit breaker in the power distribution panel and firmly press it in place.

c. *Removal and Replacement of Current Transformer.*

(1) Tag and disconnect the black and white ammeter leads from the transformer terminals.

(2) Remove the nuts and washers that secure the current transformer inside the panel, and remove the current transformer.

NOTE

Count the number of turns of heavy black wire through the center hole of the current transformer before proceeding to the next step.

(3) Disconnect the black wire wound around the current transformer from the MAIN circuit breaker and carefully unwind the wire.

CAUTION

Be sure that the number of turns around the replacement current transformer is the same as that on the original transformer.

(4) Wind the black wire around the replacement current transformer.

(5) Reconnect the black wire to the MAIN circuit breaker.

(6) Position the current transformer inside the panel and secure it with the original nuts and washers.

(7) Connect the black and white ammeter leads to appropriate terminals of the transformer.



d. Removal and Replacement of Meters.

- (1) Tag the color connections and remove the leads from the meter terminals.
- (2) Remove the bolts that secure the meter to the panel and lift meter out.
- (3) Position the replacement meter in the panel and secure it with the original bolts.
- (4) Connect the leads to the appropriate terminals of the replacement meter.

4-11. Removal and Replacement of Power Cable and Entrance Panel Connectors*a. Power Receptacles.*

- (1) Disconnect the power cable from the IN POWER 115V AC receptacle on the power distribution panel (fig. 1-11).

(2) Remove the interior cover of the power entrance panel, disconnect the wires from the appropriate receptacle, and remove the receptacle.

(3) Install the replacement receptacle, connect the wires to the proper terminals of the receptacle, and replace the cover on the power entrance panel.

b. Power Cable Connectors. Refer to figures 4-1 and 4-2 for details of construction necessary for disassembly and removal.

4-12. Removal and Replacement of Switches

(fig. 6-3)

a. Power Duct Switches.

- (1) Operate the associated circuit breaker to OFF.

(2) Remove the screws from the brackets at each end of the switch. Remove the two brackets and the switchplate.

(3) Remove the switch mounting screws and the switch.

(4) Tag and disconnect the wires from the switch and connect the wires to the replacement switch.

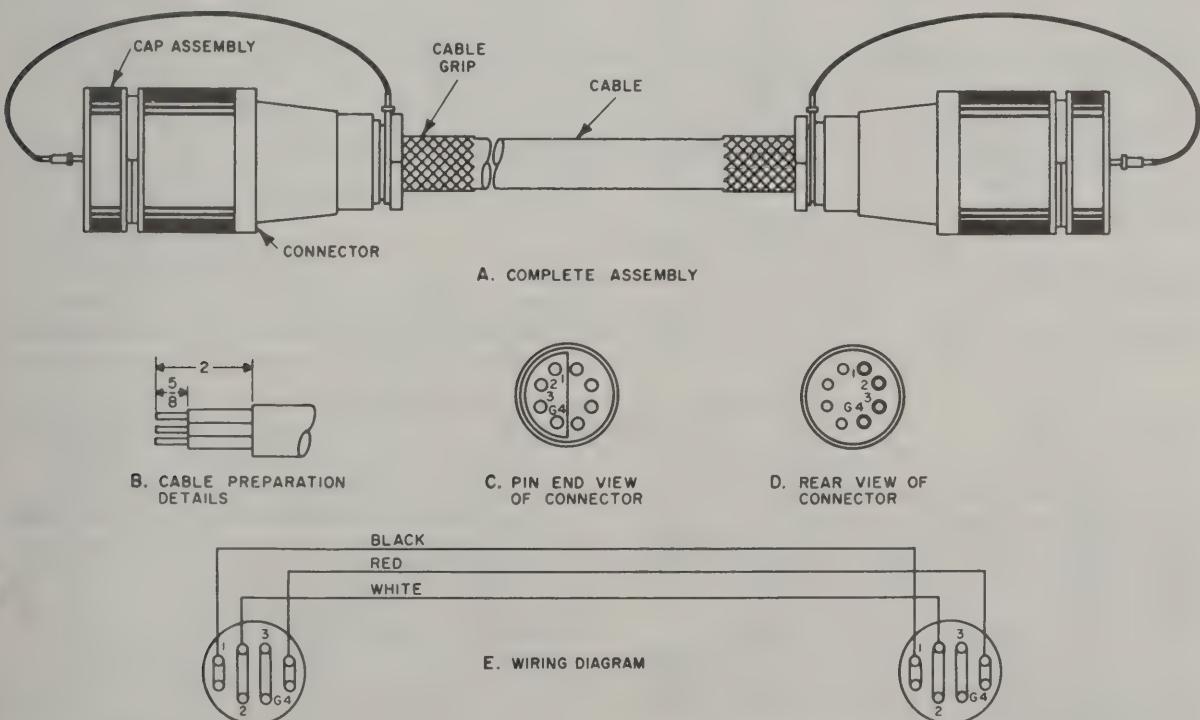
(5) Replace the switch by following the procedures given in (1), (2), and (3) above in reversed order.

b. Door Microswitch.

- (1) Disconnect power cable from IN POWER 115V AC receptacle on the power entrance panel.

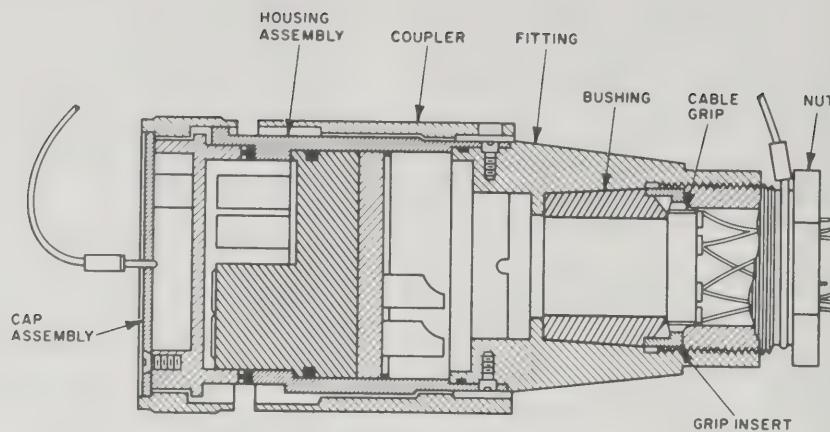
(2) Carefully pry off the signal duct cover between the BLACKOUT BYPASS switch and the HEATER 1 receptacle.

(3) Remove the wires from the NO and C terminals of the switch.

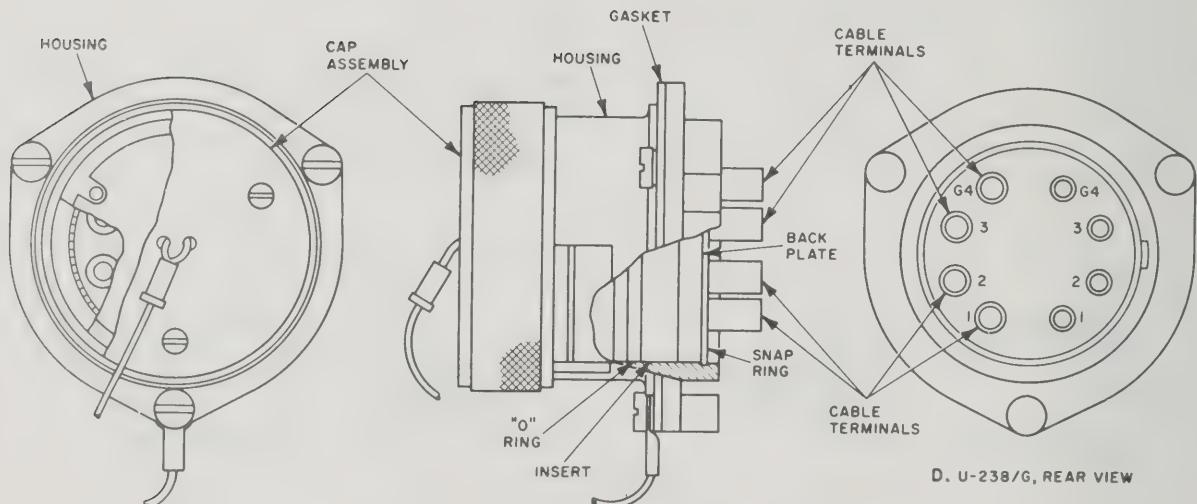


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Figure 4-1. Power cable repair details.



A. U-237/G, INTERIOR DETAILS



B. U-238/G, EXTERIOR VIEW

C. U-238/G, INTERIOR DETAILS

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Figure 4-2. Power cable connector and power receptacle assembly details.

(4) Unscrew the ringnut from the door side of the switch and remove the switch.

(5) Replace the switch by following the procedures given in (1) through (4) above in reversed order.

c. Emergency Lighting Circuit Breaker.

(1) Operate circuit breaker No. 8 to OFF. Turn off the external 48-volt power source at the SB-1399/GTA-14(V).

(2) Carefully pry off the signal duct cover.

(3) Unscrew the hexagonal nut and remove the circuit breaker switch.

(4) Tag and disconnect the wires.

(5) Connect the wires to the replacement circuit breaker switch (fig. 6-3).

(6) Replace the circuit breaker switch by following the procedures given in (1), (2), and (3) above in reversed order.

d. Information Turret Switches (fig. 6-1).

(1) Remove the screws that secure the front panel to the information turret and remove the front panel.

(2) Unscrew the switch handle from the switch.

(3) Tag and disconnect the wires from the switch. Remove the four flathead screws that secure the switch to the panel; remove the switch.

(4) Replace the switch by following the procedure given in (1), (2), and (3) above in reversed order.

4-13. Removal and Replacement of Fluorescent Light Fixture Components

Note. The fluorescent light fixtures are fabricated as part of the power duct. The radiofrequency filters are sealed units; they are not repairable and are replaced as a complete unit.

a. Operate the associated light switch to OFF; remove the light shield and fluorescent lamp (para 4-7).

b. Carefully pry off the associated power duct cover.

c. Tag and disconnect the wires from the defective component (fig. 4-3) and remove the defective component from the power duct.

d. Secure the replacement component in the power duct.

e. Connect the wires to the replacement component.

f. Replace the cover on the power duct.

g. Replace the fluorescent lamp and light shield (para 4-7).

4-14. Removal and Replacement of Batteries BB-46

a. Loosen the knurled-head bolts from the top and front covers of the battery box and remove the covers.

b. Disconnect the battery cables from the batteries.

Warning: Do not short circuit the battery terminals with the battery cables; escaping gases may be ignited and cause serious injury to personnel and damage to the equipment.

c. Slide the batteries out of the rack, one at a time, and lower them to the floor.

d. Replace the batteries by following the procedures given in a, b, and c above in the reversed order; be careful to observe the correct battery polarity when reconnecting the batteries (fig. 6-2).

4-15. Removal and Replacement of Electric Heater

(fig. 1-14)

a. Removal.

(1) Operate the HEATER-OFF-FAN switch to OFF.

(2) Remove the heater power cord connector plug from the twistlock HEATER receptacle.

(3) Loosen the four turnlock fasteners that secure the heater to the mounting base.

(4) Lift out the heater.

b. Replacement.

(1) Place the heater on the mounting base so the turnlock fasteners are aligned with the holes in the mounting base.

(2) Tighten the four turnlock fasteners.

(3) Align the power cord connector plug contacts with the HEATER receptacle. Insert the connector plug contacts in the receptacle and twist clockwise until contacts are seated.

4-16. Exhaust Blower Repairs

(fig. 4-4)

Organizational repair of the blower is restricted to replacement of the ac power cord and the blower motor and impeller.

a. Operate the BLOWER switch to OFF.

b. Remove defective power cord, blower motor, or impeller.

c. Refer to figure 4-7 to determine the correct connections for the required motor rotation and the required position of the impeller be sure that the concave portion of the impeller faces the air exhaust outlet.

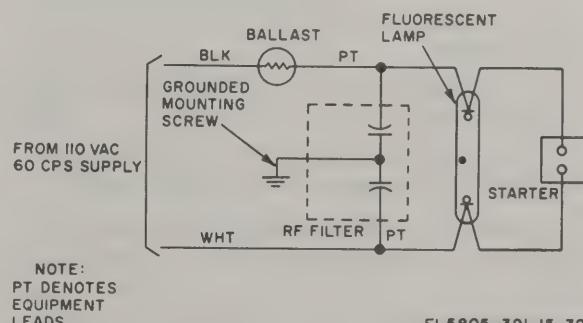
4-17. Removal and Replacement of Air Conditioner

a. Removal of Air Conditioner (fig. 4-5).

(1) Turn the AIR COND circuit breaker to OFF.

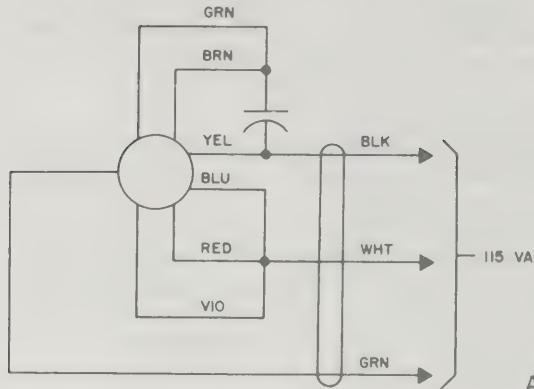
(2) Turn the air conditioner OFF-FAN-COOL selection switch to OFF.

(3) Disconnect the air conditioner power cable.



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Figure 4-3. Fluorescent light fixture, schematic-wiring diagram.



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Figure 4-4. Blower motor connections and impeller installation diagram.

(4) Remove the 14 sheet metal screws that secure the air conditioner protective cover. Remove the protective cover.

(5) Remove the four hexagonal-head studs that secure the air conditioner to the mounting bracket.

(6) Lift and slide the air conditioner forward, and remove it from the mounting bracket.

Warning: The weight of the air conditioner is approximately 200 pounds. Sufficient personnel must be available to remove the air conditioner.

(7) Remove the 17 hexagonal-head studs that secure the air conditioner mounting bracket to the shelter. Remove the mounting bracket.

b. Installation of Blank Panel (fig. 4-5).

(1) Remove the six slot-head, captive screws that secure the blank panel to the exterior front curbside of the shelter. Remove the blank panel.

(2) Place the blank panel in the air conditioner opening.

(3) Align and secure the blank panel using the six slot-head, captive screws.

(4) Adjust and tighten the wing brackets on each side of the interior of the blank panel.

c. Removal of Blank Panel. To remove the blank panel, reverse the procedure given in *b* above.

d. Replacement of Air Conditioner. To replace the air conditioner mounting bracket and the air conditioner, reverse the procedure given in *a* above.

4-18. Removal and Replacement of Exhaust Blower

a. Removal (fig. 4-6).

(1) Turn circuit breaker No. 6 to OFF.
 (2) Turn BLOWER switch to OFF (fig. 1-7).

(3) Disconnect exhaust blower power cord.
 (4) Remove 12 hexagonal-head, captive screws that secure the cover assembly to the front of the box assembly.

(5) Remove the two clamp assemblies and flexible joint from the exhaust blower and the box assembly.

(6) Remove four hexagonal-head, captive screws that secure the exhaust blower and bracket to the shelter.

Note. If the exhaust blower is being removed for repairs, proceed to (7) below; if the exhaust blower is being removed for transit, proceed to (8) below.

(7) Remove four hexagonal-head, captive screws that secure the exhaust blower to the exhaust blower bracket.

(8) Secure the exhaust blower and bracket to the inside front wall of the shelter (fig. 1-7) with the four hexagonal-head, captive screws.

(9) Remove six hexagonal-head, captive screws that secure the cover to the outside of the box assembly.

(10) Secure the cover to the shelter, with the six hexagonal-head, captive screws.

(11) Secure the cover assembly to the box assembly, with the 12 hexagonal-head, captive screws.

b. Replacement (fig. 4-6). To replace the exhaust blower, reverse the procedure given in *a* above.

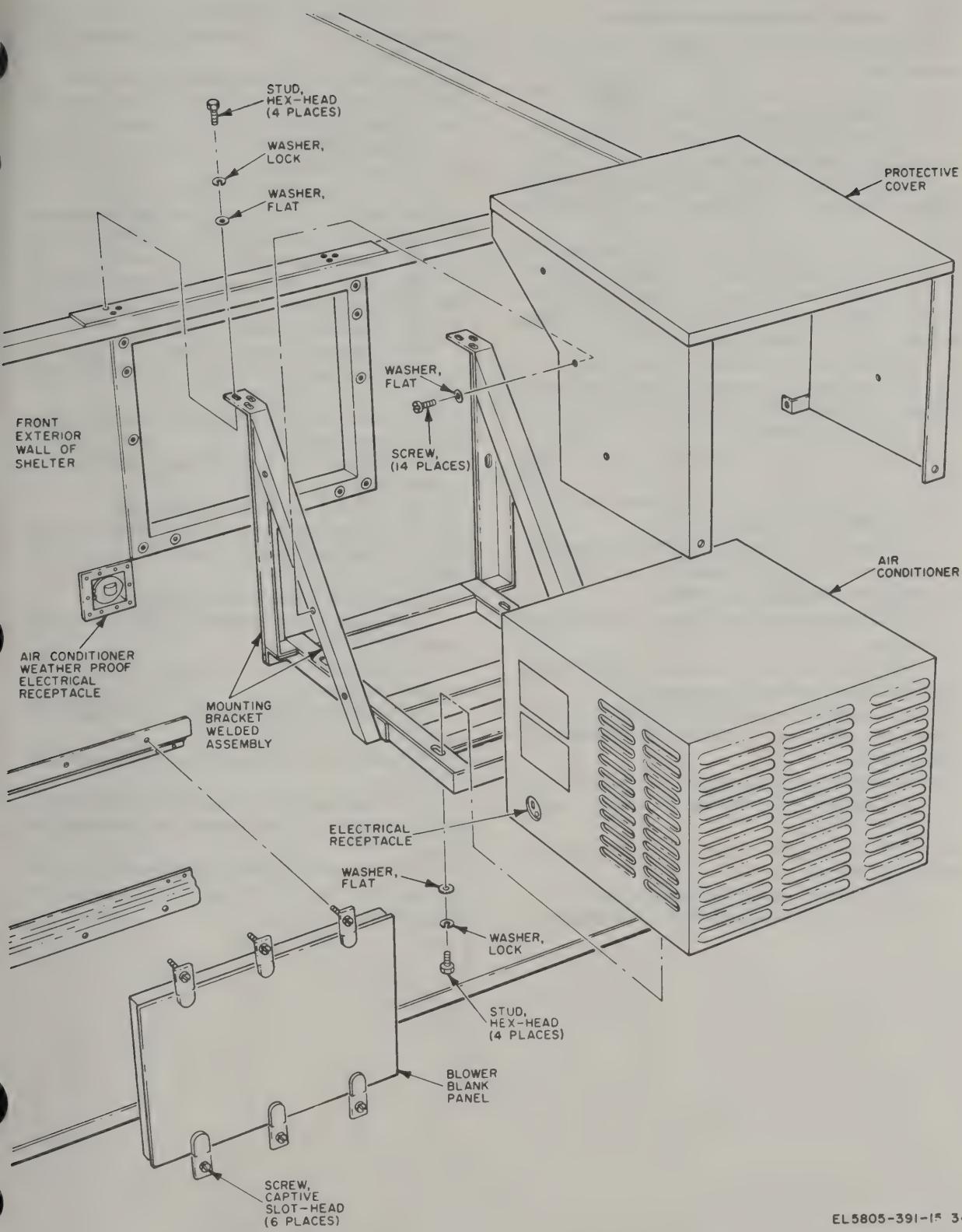


Figure 4-5. Removal of air conditioner and installation of blank panel.

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4-19. Battery Exhaust Blower Repairs

a. Removal and Replacement of Battery Exhaust Fan.

(1) Disconnect and remove the BB-46 nearest the battery exhaust fan (para 4-14).

(2) Disconnect the battery exhaust fan power cord from its receptacle.

(3) Loosen the hose clamp and remove the flexible hose and hose clamp from the exhaust fan.

(4) Remove the retaining screws from the battery exhaust fan cover and remove the cover.

(5) From the inside of the battery case, remove the three screws that hold the fan housing and motor to the battery case.

(6) Remove the battery exhaust fan.

(7) Replace the battery exhaust fan by following the procedures given in (1) through (6) above in reversed order.

b. Removal and Replacement of Ac Power Cord.

(1) Remove the battery exhaust fan cover (a(1) through (5) above).

(2) Remove the wire nut that connects the black wire of the power cord to the white-blue and white-red wires of the motor.

(3) Separate the black wire from the other two wires.

(4) Unsolder the white wire of the power cord from the blower motor capacitor.

(5) Replace the power cord by following the procedures given in (1) through (4) above in reversed order.

c. Removal and Replacement of Capacitor.

(1) Remove the exhaust fan cover (a(1) through (5) above).

(2) Unsolder the three wires from the capacitor terminals.

(3) Loosen the capacitor clamp bolt.

(4) Slide the capacitor out of the clamp.

(5) Replace the capacitor by following the procedures given in (1) through (4) above in reversed order.

d. Removal and Replacement of Impeller.

(1) Remove the battery exhaust fan from the battery case (a(1) through (5) above).

(2) Remove the four screws that secure the fan housing to the motor.

(3) Remove the fan housing.

(4) Loosen the two Allen-head setscrews that secure the impeller to the motor shaft.

(5) Slide the impeller off the shaft.

(6) Slide the new impeller (setscrews away from the motor) onto the shaft.

(7) Tighten the setscrews.

(8) Replace the fan housing.

e. Removal and Replacement of Flexible Airhose.

(1) Remove the battery exhaust fan cover (a(1) through (5) above).

(2) Loosen the hose clamp at each end of the flexible airhose.

(3) Remove the hose and clamps.

(4) Replace the hose by following the procedures given in (1), (2), and (3) above in reversed order.

f. Removal and Replacement of Motor.

(1) Remove the battery exhaust fan (a(1) through (5) above).

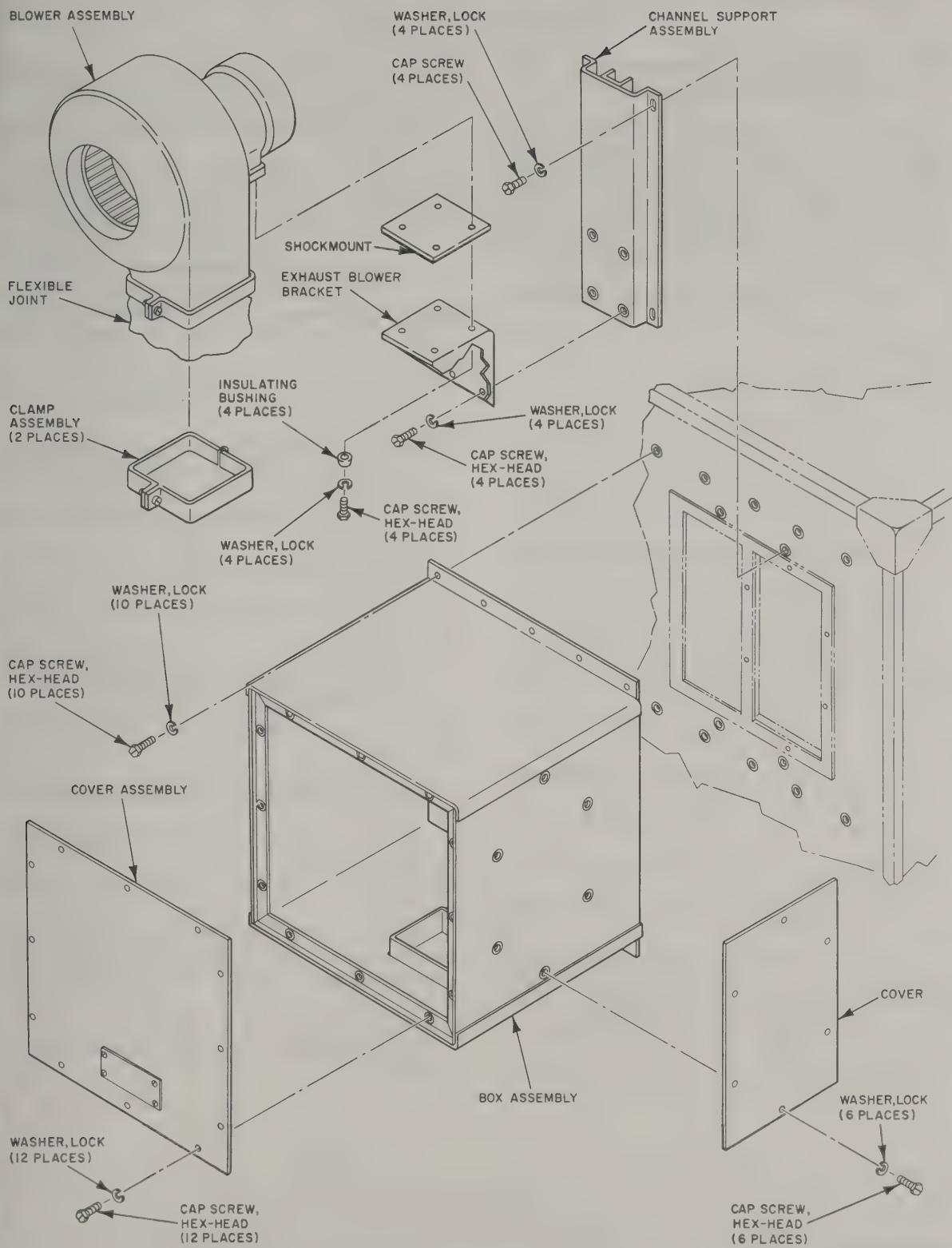
(2) Remove the ac power cord (b(1) through (4) above).

(3) Remove the capacitor (c(1) through (4) above).

(4) Remove the impeller (d(1) through (5) above).

(5) Remove the two screws that secure the capacitor clamp to the motor and remove the clamp.

(6) Replace the motor by following the procedures given in (1) through (5) above in reversed order.



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Figure 4-6. Removal and replacement of exhaust blower.

Section IV. DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE

4-20. Scope of Direct Support and General Support Maintenance

a. General. Direct and general support maintenance consists entirely of corrective maintenance procedures as indicated in the maintenance allocation chart (app C).

b. Tools and Test Equipment Required. The tools and test equipment required for direct and general support maintenance of the AN/TTC-23 are listed in section III of the maintenance allocation chart (app C).

4-21. Direct Support Repair Procedures

Direct support repair of the S-280B/G shelter includes the following:

a. Emergency repairs of holes and minor structural damage to the shelter.

b. Removal and replacement of the door handle and latchbolt assemblies, entrance door filter, cover assemblies, and gaskets for the blower vent, door, and entrance panels. Refer to TB 43-0124 for additional information on direct support maintenance of the shelter.

4-22. General Support Repair Procedures

a. Shelter, Electrical Equipment S-280B/G, Repairs. General support maintenance of the shelter includes replacement of doors and skids, and permanent repair of holes and major structural damage. Refer to TB 43-0124 for additional information on general support maintenance of the shelter.

b. Removal of Signal Entrance Panel 26-Pair Receptacle (fig. 4-7).

(1) Remove the screws that secure the cover to the rear of the signal entrance panel.

(2) Remove the cover from the defective 26-pair receptacle.

(3) Remove the mounting screws that secure the insert clip to the housing.

(4) Unfasten the cable clip that secures the cable form.

Caution: Be extremely careful when connecting and soldering wires to the receptacle insert. Excessive heat or pressure will damage the receptacle insert.

(5) Lift the receptacle insert out of the housing; tag and unsolder the wires.

(6) Remove the mounting screws and remove the

housing.

c. Replacement of Signal Entrance 26-pair Receptacle (fig. 4-7).

(1) Position the housing and secure it to the signal entrance panel.

Caution: Be extremely careful when connecting and soldering wires to the receptacle insert. Excessive heat or pressure will damage the receptacle insert.

(2) Slide the end of the cable form out through the housing and connect the wires to the receptacle insert.

Caution: Be careful not to damage the wires when replacing the receptacle insert mounting screws.

(3) Secure the cable form by fastening the cable clip.

(4) Install the cover on the housing.

(5) Position and secure the rear cover on the signal entrance panel.

d. Removal of 26-Pair Cable Connectors (fig. 4-8).

(1) Loosen the setscrews and slide the locking ring back on the cable.

(2) Remove the clamping bolts and clamp nuts from the cable clamp.

(3) Remove the retaining bolts and both sections of the cable clamp.

(4) Slide the enforcement and nylon insulation back on the cable.

(5) Remove the contact assembly retaining screws.

(6) Work the cable into the housing and lift the contact assembly out of the housing.

(7) Slide the separator away from the contact assembly.

(8) Tag and disconnect the leads.

(9) Remove the separator and slide the housing off the cable.

(10) Slide the nylon insulator, enforcement, locking ring, and cover off the cable.

e. Replacement of 26-Pair Cable Connectors (fig. 4-8).

(1) Slide the cover, locking ring, enforcement, and nylon insulator on the cable. Be sure the flange on the enforcement and nylon insulator is toward the cable end.

(2) Slide the housing on the cable.

(3) Install the separator with the heads properly positioned.

(4) Position the contact assembly near the housing and connect the leads.

(5) Replace the contact assembly in the housing. If necessary, work the cable out of the housing to provide clearance for the contact assembly.

(6) Be sure that the contact assembly is properly seated and secure it to the housing with the contact assembly retaining screws.

(7) Slide the nylon insulator forward until its flange is flush against the housing.

(8) Slide the enforcement forward until its flange is flush against the nylon insulator.

(9) Replace the sections of the cable clamp and secure them with the retaining bolts.

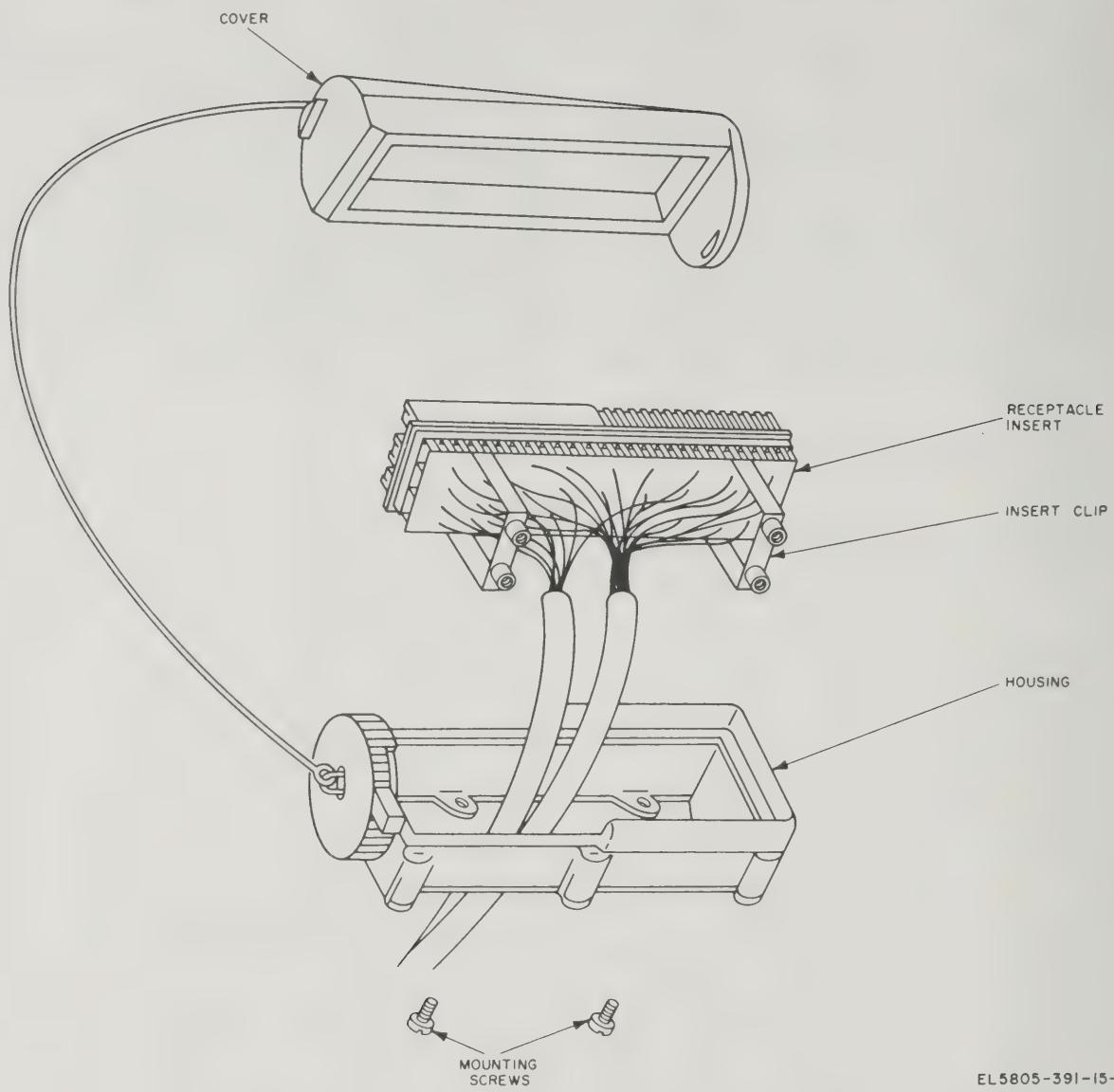
(10) Replace the clamping bolts and nuts, and tighten them securely.

(11) Slide the locking ring into position on the housing and secure it with the setscrew.

(12) Replace the cover.

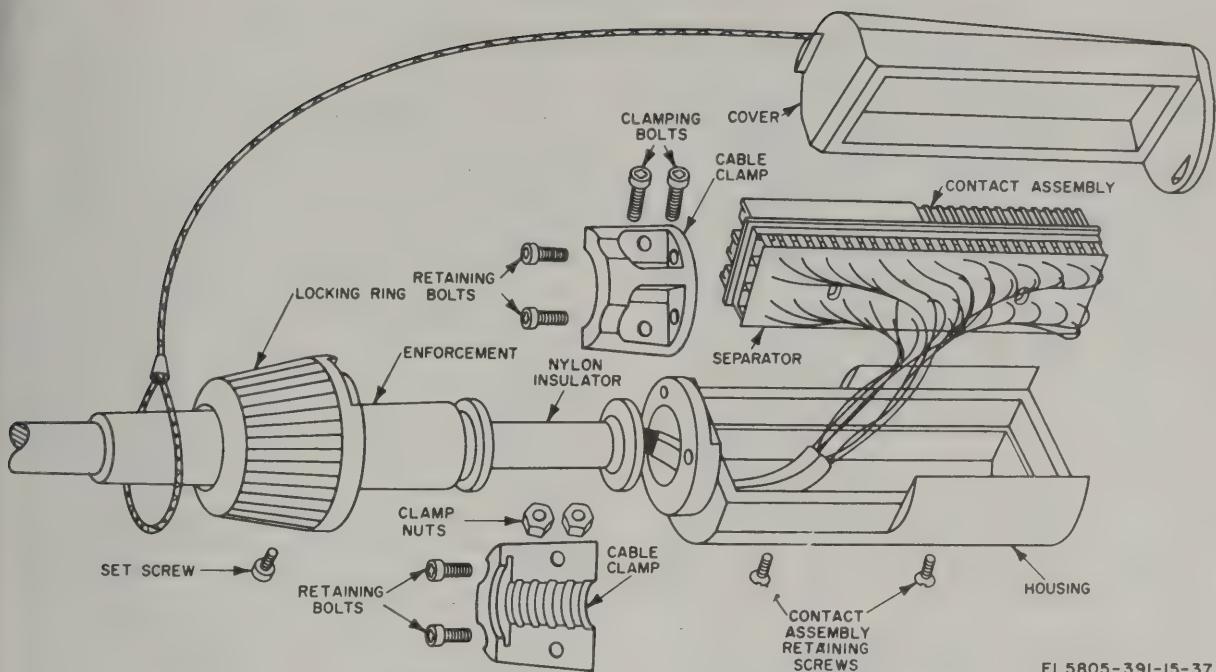
4-23. Depot Maintenance

Depot maintenance of Central Office, Telephone Manual AN/TTC-23 includes major repair and over-haul of the equipment components of the shelter facility. Refer to the applicable technical manual (app A) for the individual equipment components for depot overhaul standards and procedures. Refer to Appendix E for the final performance testing of the complete facility.



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Figure 4-7. Signal entrance panel 26-pair receptacle, exploded view.



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Figure 4-8. Twenty-six pair cable connector, exploded view.



CHAPTER 5

FUNCTIONING OF AN/TTC-23 AND AN/TTC-23A

5-1. AN/TTC-23 Signal Circuits

a. General. The AN/TTC-23 provides manual telephone switching facilities for 98 local circuits, 12 two-way plug supervision trunks, and 2 information circuits. The line and trunk relay equipment (CV-1548/G, TA-452/GTA-14(V), and TA-276/TTC), the main distribution frames (TA-454/GTA-14(V)), the telephone switchboards (BB-1398/GTA-14(V)), and the information facilities are all contained within the shelter. Forty-eight-volt direct-current (dc) power for operation of the central office components is provided by the SB-1399/GTA-14(V) and central office battery (BB-46), which are also included in the shelter.

b. Local Lines (fig. 6-2). The local lines are wired from receptacles to the line side of the main distributing frame (TA-454/GTA-14(V)). The switchboard side of the main distributing frame is wired, through cables, to the line relay equipment (TA-452/GTA-14(V)). The line relay equipment is wired to switchboard POSITION 1 and multiplied on a two-panel arrangement to switchboard POSITION 2. Cross connections on the main distributing frame are initially provided on a straight-through, line-for-line basis; however, the cross connections may be rearranged as required.

c. Plug Supervision Trunks (fig. 6-2). The two-way plug supervision trunks use SIGNAL 6 at the signal entrance box, through the converter (CV-1548/G) to main distribution frame No. 2. The 12 trunk circuits, cabled to MDF No. 2, cross connect to any of 20 trunks at Switchboard Telephone, Manual SB-1398/GTA-14(V). The plug supervision is only compatible with another AN/TTC-23 similarly equipped with Converter, Telephone Signal CV-1548/C.

5-1.1. AN/TTC-23A Signal Circuits

a. General. The AN/TTC-23A provides manual telephone switching facilities for 120 local lines, 2 information circuits, and 24 spare lines. The Converter, Telephone Signal CV-1548/G and Telephone Circuit, Trunk Relay TA-276/TTC have been removed and an additional Telephone Circuit, Line Relay TA-452/GTA-14(V) installed. This increased the number of lines and removed the two-way supervision trunks. No other facilities are affected.

b. Local Lines (fig. 6-4). Lines on SIGNAL 1 through SIGNAL 5 are cabled through to the switchboards as described in paragraph 5-1*b* above, through main distribution frame (TA-454/GTA-14(V)) No. 1. Lines on SIGNAL 6 are cabled through main distribution frame No. 2 and line relay panel No. 2 using different receptacles.

5-2. Central Office Power and Miscellaneous Circuits

a. Central Office Power (fig. 6-2). The SB-1399/GTA-14(V) and the BB-46's (central office battery) supply the 48 volts dc for the operation of the central office. The SB-1399/GTA-14(V) is wired to switchboard POSITION 2. From switchboard POSITION 2, the 48 volts dc is wired through switchboard POSITION 1 to the line and trunk relay equipment.

b. Ringing Current (fig. 6-2). The 20-Hz ringing current from the SB-1399/GTA-14(V) is wired directly to switchboard POSITION 2 and then to switchboard POSITION 1.

c. Night Alarm (fig. 6-2). The night alarm circuits of the line relay equipment (TA-452/GTA-14(V)) and the trunk relay equipment (TA-276A/TTC) are wired directly to the night alarm bell through N/A BELL control switch.

d. Emergency Lighting (fig. 6-3). The central office battery is also wired to emergency lighting relay K1, through circuit breaker CB8, to provide emergency lights during failure of the ac power source.

5-3. Information Circuits

a. Information Turret (fig. 6-1). The information turret contains two circuits that operate identically. Circuit one is described as follows:

(1) *Answering incoming call.* Ringing current applied to INFO CKT 1 from the switchboard causes CALL lamp DS1 to light. Switch S1 is operated to TALK; this connects the information telephone to INFO LINE 1.

(2) *Holding call.* Switch S1 is operated to HOLD. Contacts of switch S1 close a circuit through resistor R1 across INFO LINE 1, open the circuit to the information telephone, and apply 48 volts dc to HOLD lamp DS3.

b. Information Circuits (fig. 6-2). Two information circuits, from the information turret, are direct-connected to binding posts in the signal entrance panel.

5-4. Ac Power Circuits

(fig. 6-3).

a. Ac Power Distribution.

(1) Ac power is applied to the AN/TTC-23 through IN POWER 115V AC receptacle J12 on the power entrance panel.

(2) Ac power from receptacle J12 is applied through the power duct to MAIN circuit breaker switch CB7 in the power distribution panel. Circuit breaker switches CB1 through CB6 (parallel-connected) are

series-connected with CB7. Wiring to the equipment and convenience receptacles is distributed through the power duct from circuit breaker switches CB1 through CB6. Lamp DS7 is connected across the ac input lines to CB7, and lights when ac power is applied to the AN/TTC-23. Lamps DS1 through DS6 are connected across the circuits controlled by CB1 through CB6, respectively, and light individually as each circuit breaker switch is operated to ON.

b. Grounding. The AN/TTC-23 is grounded to

reduce electrical shock hazards (para 2-4).

c. Voltmeter and Ammeter.

(1) Voltmeter M2 is connected across the ac input circuit before MAIN circuit breaker switch CB7. It indicates the voltage applied from the power source to the AN/TTC-23.

(2) Ammeter M1 is connected to the ac input circuit through current transformer T1. It indicates the total current being drawn by the operating components of the AN/TTC-23.

CHAPTER 6

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

6-1. Preliminary Procedures

- a. Turn off all operating equipment according to the stopping procedures in paragraph 3-4.
- b. Turn all switches and circuit breakers to OFF.
- c. Check to see that all equipments are secure in their proper storage places.
- d. For prolonged storage or long distance shipment, remove the batteries from the SB-1399/GTA-14(V), the TA-312/PT and from the hand lantern.
- e. Remove the mounting straps and fixtures from the storage cabinets for use in securing the equipment.
- f. Secure all items on the common items panel with the clamps provided and mount the waste-paper basket on its bracket.
- g. Place all miscellaneous items in the storage cabinets.

6-2. Disassembly of Equipment

- a. Disconnect all field wires from the signal entrance panel binding posts (fig. 1-12).
- b. Disconnect the 26-pair cable at the signal entrance panel and replace the covers on the receptacles and connectors (fig. 1-12).
- c. When 115-volt ac power is obtained from an adjacent shelter, disconnect the AN/TTC-23 power cable from the POWER 115V AC OUT receptacle at the adjacent shelter. Replace the receptacle and connector cover.
- d. When 115-volt ac power is obtained from a commercial source, proceed as follows:
 - (1) Turn off or disconnect the power.
 - (2) Disconnect the power cable connector from the power cable stub connector. Replace both connector covers.
 - (3) Disconnect the power cable stub from the commercial source and store it in a storage cabinet.

- e. Disconnect the power cable from the IN POWER 115V AC receptacle on the power entrance panel and replace the covers on the receptacle and connector.
- f. Disconnect the ground strap from the GROUND TERMINAL on the power entrance panel.
- g. Disconnect the ground strap from the ground rod and store it in a storage cabinet.
- h. Remove the ground rod, clean, and store it in the shelter (fig. 1-8).
- i. Wind the power cable assembly on the cable reel and secure the cable reel to the floor of the shelter (fig. 1-4).
- j. Disconnect the air conditioner power cable and store it in a storage cabinet.

6-3. Checking and Securing AN/TTC-23

- a. Close and secure the covers on the signal and power entrance panels.
- b. Secure the exhaust blower for transit (para 4-18).
- c. Close and secure the blower vent cover on the front of the shelter and the filter vent on the entrance door.
- d. Close and secure the battery vent cover on the rear roadside of the shelter.
- e. Check the area to make sure that all components and parts have been recovered and stored.
- f. Check the interior of the AN/TTC-23 to make sure that all components and parts have been properly secured and that all compartment doors are closed and secured.
- g. If the AN/TTC-23 is truck-mounted, close and secure the tailgate and check to see that the sling assembly is secure.

6-4. Repackaging for Shipment or Limited Storage

Rerepackaging of the AN/TTC-23 for shipment or limited storage normally will be performed at a

packaging facility or by a repacking team. Should emergency packaging be required, select the materials from those listed in SB 38-100. Package the equipment in accordance with the original packaging, in so far as possible, with the available materials.

Note. For repackaging of the major components, refer to the instructions given in the applicable technical manuals listed in appendix A.

Caution: When transporting the AN/TTC-23 by air, the outside vent covers of the shelter must be opened to equalize the atmospheric pressure in the shelter.

Section II. DEMOLITION TO PREVENT ENEMY USE

6-5. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. Use the destruction procedures outlined in paragraph 6-6 to prevent further use of the equipment.

6-6. Methods of Destruction

Use any or all of the following methods to destroy the equipment.

a. Smash. Smash the controls, tubes, coils, relays, switches, capacitors, transformers, and meters.

b. Cut. Cut all cables and cords and slash the wiring on the components.

c. Burn. Burn cords and technical manuals.

Warning: Be extremely careful with explosives and incendiary grenades. Use these items only when the need is urgent.

d. Bend. Bend panels and cabinets.

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX A

REFERENCES

DA Pam 310-4
SB 11-6
SB 11-30
SB 38-100

TB 11-6625-666-50
TB 43-0118

TB 43-0124

TM 11-2146

TM 11-5805-201-12

TM 11-5805-201-35

TM 11-5805-367-12

TM 11-5805-367-20P-5

TM 11-5805-367-34-5

TM 11-5805-367-34P-5

TM 11-5805-558-23P

TM 11-5830-221-12

TM 11-5830-221-24P

TM 11-5965-206-14P

Index of Technical Publications.
Dry Battery Supply Data.
Dry Battery Management Data.
Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
Inspection Requirements for Repaired Electrical Indicating Instruments.
Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
Maintenance and Repair Procedures for Shelters, Electrical Equipment S-141/G and S-141B/G; S-144/G, A, B, C, and D/G; S-250/G; S-250/G (Shielded); S-280/G; S-280A/G, S-280B/G, S-280B/G (Shielded); S-318/G and S-318A/G.
Central Office, Telephone, Manual AN/TTC-7 (NSN 5805-00-395-9422) and AN/TTC-7A (NSN 5805-00-820-9549); Telephone Central Office Group AN/GTA-14(V) (NSN 5805-00-892-1081) and Telephone Circuit Trunk Relay TA-276A/TTC (NSN 5805-00-503-3347).
Operator's and Organizational Maintenance Manual: Telephone Set TA-312/PT (NSN 5905-00-543-0012).
Direct Support, General Support, and Depot Maintenance Manual: for Telephone Set TA-312/PT (NSN 5805-00-543-0012).
Operator's and Organizational Maintenance Manual: Multiplexers TD-202/U, TD-203/U, TD-204/U, TD-352/U, and TD-353/U; Restorer, Pulse Form TD-206/U and Converter, Telephone Signal CV-1548/G and CV-1548A/G.
Organizational Maintenance Repair Parts and Special Tools Lists for Converter, Telephone Signal CV-1548/G and CV-1548A/G (NSN 5805-00-069-8795).
Direct Support and General Support Maintenance Manual: Converter, Telephone Signal CV-1548/G and CV-1548A/G (NSN 5805-00-069-8795).
Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Converter, Telephone Signal CV-1548/G and CV-1548A/G (NSN 5805-00-069-8795).
Organizational and Direct Support Maintenance Repair Parts and Special Tools Lists for Telephone Circuit Truck Relay TA-276A/TTC (NSN 5805-00-503-3347).
Operator's and Organizational Maintenance Manual: Intercommunications Stations LS-147A/FI, LS-147B/FI, LS-147C/FI and LS-147D/FI.
Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools): Intercommunications Station LS-147C/FI (NSN 5830-00-752-5357).
Operator's, Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools): Headset-Microphone H-91A/U (NSN 5965-00-669-6871); Handset-Headset H-144/U, H-144A/U, H-144B/U and H-144C/U (NSN 5965-00-682-2769) and

TM 11-6105-200-50
TM 11-6110-201-12P

Headset-Microphone H-210/G (NSN 5965-00-892-1068).
Depot Maintenance Manual for Fractional Horsepower Motors.
Operator's and Organizational Maintenance Repair Parts and Special
Tools Lists for Distribution Box J-1077/U and J-1077A/U (NSN 6110-
00-758-7574).

TM 11-6110-201-34P

Direct Support and General Support Maintenance Repair Parts and
Special Tools Lists (Including Depot Maintenance Repair Parts and
Special Tools) for Distribution Box J-1077/U and J-1077A/U (NSN
6110-00-958-7574).

TM 11-6625-510-24P

Organizational, Direct Support, and General Support Maintenance
Repair Parts and Special Tools Lists (Including Depot Maintenance
Repair Parts and Special Tools): Test Set, Telephone TS-1361/G (NSN
6625-00-691-3066).

TM 38-750

The Army Maintenance Management System (TAMMS).

APPENDIX B

BASIC ISSUE LIST (BIIL) AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST (ITIAL)

Section I. INTRODUCTION

B-1. Scope

This appendix lists only basic issue items required by the crew/operator for installation, operation, and maintenance of Central Office, Telephone, Manual AN/TTC-23.

B-2. General

This Basic Issue Items and Items Troop Installed or Authorized List is divided into the following sections:

a. Basic Issue Items List - Section II. A list, in alphabetical sequence, of items which are furnished with, and which must be turned in with the end item.

b. Items Troop Installed or Authorized List - Section III. Not applicable.

B-3. Explanation of Columns

The following provides an explanation of columns found in the tabular listings:

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Not applicable.

b. Federal Stock Number. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes.

c. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

d. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., and is identified in SB 708-42.

e. Description. Indicates the Federal item name and a minimum description required to identify the item.

f. Unit of Measure (U/M). Indicates the standard of basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation, (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

g. Quantity Furnished with Equipment (Basic Issue Items Only). Indicates the quantity of the basic issue item furnished with the equipment.

Section II. BASIC ISSUE ITEMS LIST

(1) Illustration		(2) Federal stock number	(3) Part number	(4) FSCM	(5) Description	Usable on code	(6) Unit of meas	(7) Qty furn with equip
(A) Fig No	(B) Item No.							
1-5		5110-293-2339	SC-C-539451	80063	AXE, SINGLE BIT		EA	1
1-5		4210-270-4512	SC-D-539482	80063	EXTINGUISHER, FIRE		EA	1
1-3		5120-251-4489	SC-C-539505	80063	HAMMER, HAND		EA	1
1-8		6545-922-1200	SC-D-539483	80063	KIT, FIRST AID, GENERAL PURPOSE		EA	1
1-8		5340-802-7406	774-1/2B	66821	PADLOCK		EA	1
		5975-224-5260			ROD GROUND MX-148G		EA	1
		5340-016-5716	SC-B-547271-GPI	80063	STRAP ASSEMBLY, TIEDOWN: APPROX 24 IN. LG		EA	2
		5340-016-5669	SC-B-547271-GPIV	80063	STRAP ASSEMBLY, TIEDOWN, 54 IN. LG			

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General.

This appendix provides a summary of the maintenance operations for the AN/TTC-23 and AN/TTC-23A. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Function.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (de-contaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly),

end item, or system. This function does not include the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

C-3. Column Entries.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in the column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time,

and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C—Operator/Crew
 O—Organizational
 F—Direct Support
 H—General Support
 D—Depot

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

C-4. Tool and Test Equipment Requirements (Sec III).

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used

in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

C-5. Remarks (Sec IV).

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarify items appearing in section II.

(Next printed page is C3.)

**SECTION II MAINTENANCE ALLOCATION CHART
FOR**
CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-23 AND AN/TTC-23A

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-23 AND AN/TTC-23A	Inspect Test	0.2 0.2					4	A
01	SHELTER FACILITY S-376/TTC-23	Inspect Test Test Repair Repair	0.1	0.3		0.4	1.5	1 1,3 1,2	B C D E
		Overhaul		0.3			40.0	1 thru 4, 6 1 thru 4, 6	
0101	SHELTER, ELECTRICAL EQUIPMENT S-280/G (MODIFIED) SEE TB 43-0124 FOR MAINTENANCE FUNCTIONS								
0102	CONVERTER, TELEPHONE SIGNAL CV-1548/G (SEE TM 11-5805-367-12 FOR MAINTENANCE FUNCTIONS)	Replace		0.2				5	
0103	DISTRIBUTION BOX J-1077A/U (SEE TM 11-5805- 367-12 FOR MAINTENANCE FUNCTIONS)	Replace	0.2					5	
0104	HEADSET-MICROPHONE H-210/G (SEE TM 11-5965- 206-15P FOR MAINTENANCE FUNCTIONS)	Replace	0.1					5	
0105	INTERCOMMUNICATIONS STATION LS-147C/FI (SEE TM 11-5830-221-12 FOR MAINTENANCE FUNCTIONS)	Replace	0.2					5	
0106	MAIN DISTRIBUTION FRAME TA-454/GTA-14(V) (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.3				5	
0107	PANEL, POWER DISTRIBUTION SB-1399/GTA-14(V) (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.3				5	
0108	SWITCHBOARD, TELEPHONE, MANUAL SB-1398/GTA-14(V) (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.4				5	
0109	TELEPHONE CIRCUIT, LINE RELAY TA-452/GTA-14(V) (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.2				5	
0110	TELEPHONE CIRCUIT, TRUNK RELAY TA-276A/TTC (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.2				5	
0111	TELEPHONE SET TA-312/PT (SEE TM 11-5805- 201-12 FOR MAINTENANCE FUNCTIONS)	Replace	0.2					5	
0112	TEST SET, TELEPHONE TS-1361/G (SEE TM 11-2146 FOR MAINTENANCE FUNCTIONS)	Replace		0.2				5	
0113	AIR CONDITIONER (USANEC RESPONSIBILITY)	Replace		0.3				5	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS

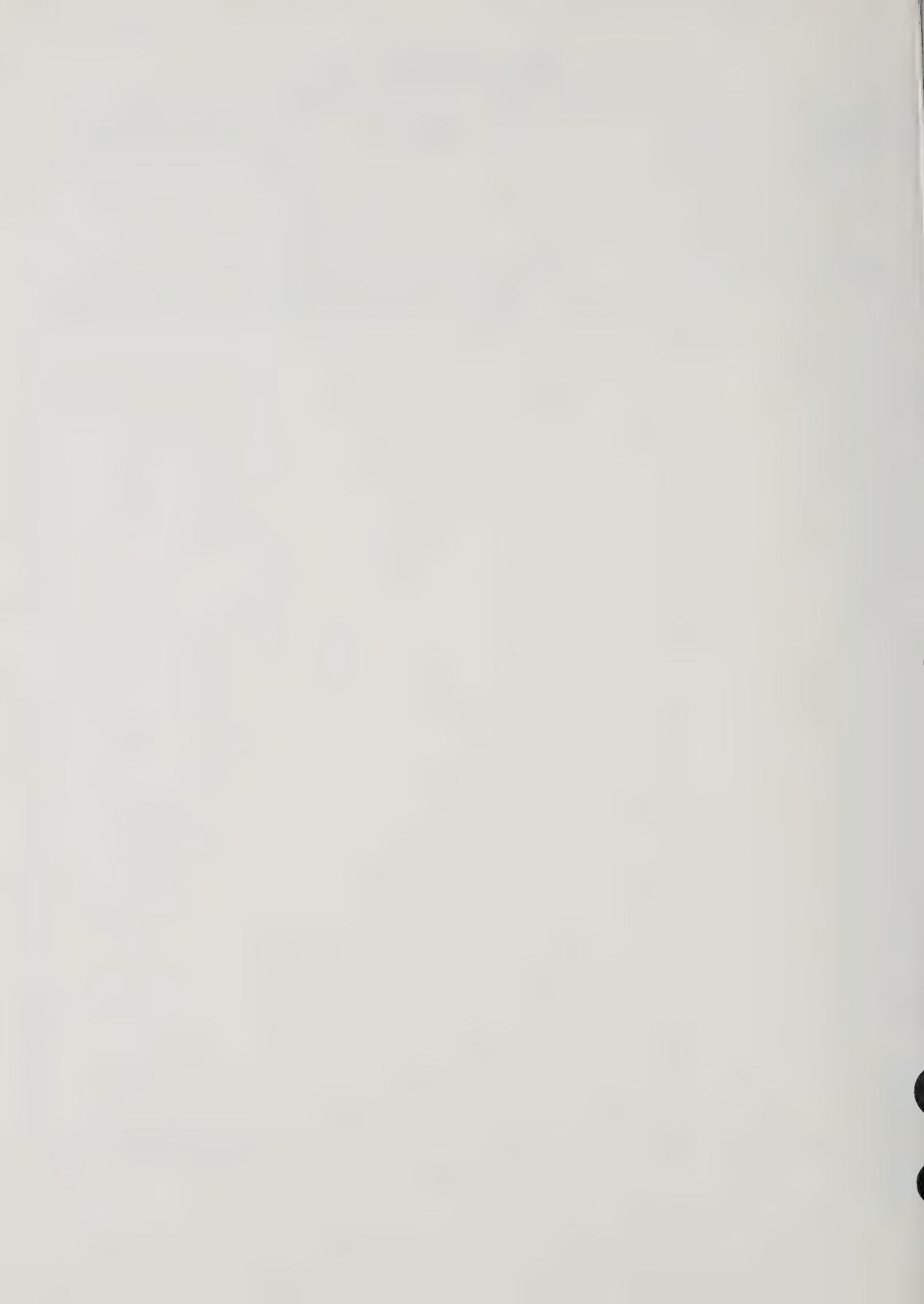
FOR

CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-23 AND AN/TTC-23A

TOOL OR TEST EQUIPMENT REF. CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,H,D	MULTIMETER AN/USM-223	6625-00-999-7465	
2	O,D	OHMMETER ME-213A/U	6625-00-880-9446	
3	H,D	OHMMETER ZM-21A/U	6625-00-643-1030	
4	O,D	TOOL KIT, ELECTRONIC EQUIPMENT SHELTER TK-144/G	5180-00-973-4369	
5	C,O,D	TEST SET, TELEPHONE TS-1361/G (P.O. AN/TTC-23)	6625-00-691-3066	
6	C,O	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	SYSTEM OPERATION SUING BUILT-IN FACILITIES.
B	CONTINUITY OF POWER, LIGHTING AND SIGNAL CIRCUITS.
C	DEPOT MAINTENANCE FINAL PERFORMANCE TESTING REQUIRED AFTER OVERHAUL FUNCTION IS COMPLETE.
D	BY REPLACEMENT OF FUSES, CABLE ASSEMBLIES, FLUORESCENT STARTERS AND LAMPS, CLOCK, LANTERN, ELECTRIC.
E	POWER DISTRIBUTION PANEL, SIGNAL AND POWER ENTRANCE PANEL, EXHAUST BLOWER AND REPLACEMENT OF METERS, CIRCUIT BREAKERS, CONNECTORS, JACK TELEPHONE, RELAY, SWITCHES, FLUORESCENT LIGHT FIXTURES, ELECTRIC HEATERS.



APPENDIX D

ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT

MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

(INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

Section I. INTRODUCTION

D-1. Scope

This appendix lists spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of organizational, direct support, and general support maintenance of the AN/TTC-23 and AN/TTC-23A. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

D-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. *Section II. Repair Parts List.* A list of spares and repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence.

b. *Section III. Special Tools List.* Not applicable.

c. *Section IV. National Stock Number and Part Number Index.* A list, in National item identification number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list, in alphabetic sequence, of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

D-3. Explanation of Columns

a. *Illustration.* This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item number.* The number used to identify item called out in the illustration.

b. *Source, Maintenance, and Recoverability (SMR) Codes.*

(1) *Source code.* Source codes indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.

PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional in-
----	---

<i>Code</i>	<i>Definition</i>
IT	Initial issues or outfittings. Not subject to automatic replenishment.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA and aircraft support items as restricted by AR 700-42.

(2) *Maintenance code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

<i>Code</i>	<i>Application/Explanation</i>
C	—Crew or operator maintenance performed within organizational maintenance.
O	—Support item is removed, replaced, used at the organizational level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

<i>Code</i>	<i>Application/Explanation</i>
O	—The lowest maintenance level capable of complete repair of the support item is the organizational level.
D	—The lowest maintenance level capable of complete repair of the support item is the depot level.
Z	—Nonreparable. No repair is authorized.

(3) *Recoverability code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

*Recoverability
codes**Definition*

Z —Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.

O —Reparable item. When uneconomically repairable, condemn and dispose at organizational level.

D —Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.

c. *National Stock Number*. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

d. *Part Number*. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. *Federal Supply Code for Manufacturer (FSCM)*. The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. *Description*. Indicates the Federal item name and, if required, a minimum description to identify the item.

g. *Unit of Measure (U/M)*. Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. *Quantity Incorporated in Unit*. Indicates the

quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly.

D-4. Special Information

Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable on codes used in this publication are:

<i>Code</i>	<i>Used on</i>
AQ6	AN/TTC-23
5KM	AN/TTC-23A

D-5. How to Locate Repair Parts

a. When National stock number or part number is unknown.

(1) *First*. Using the table of contents, determine the functional group within which the item belongs. This is necessary since illustrations are prepared for functional groups and listings are divided into the same groups.

(2) *Second*. Find the illustration covering the functional group to which the item belongs.

(3) *Third*. Identify the item on the illustration and note the illustration figure and item number of the item.

(4) *Fourth*. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National stock number or part number is known.

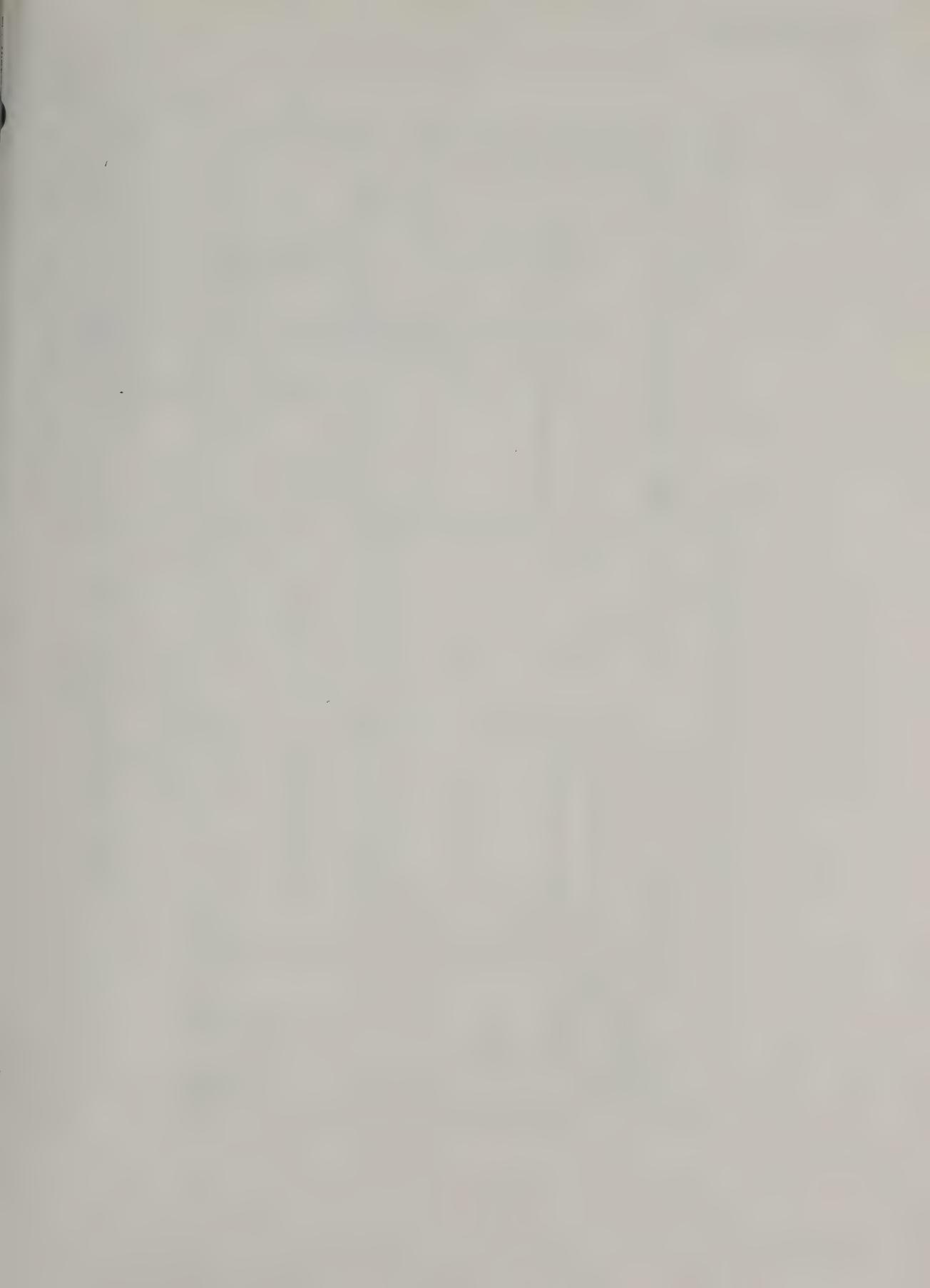
(1) *First*. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in NIIN sequence followed by a list of part numbers in alphabetic sequence, cross-referenced to the illustration figure number and item number.

(2) *Second*. After finding the figure and item number, locate the figure and item number in the repair parts list.

D-6. Abbreviations

Not applicable.

(Next printed page is D-4.)



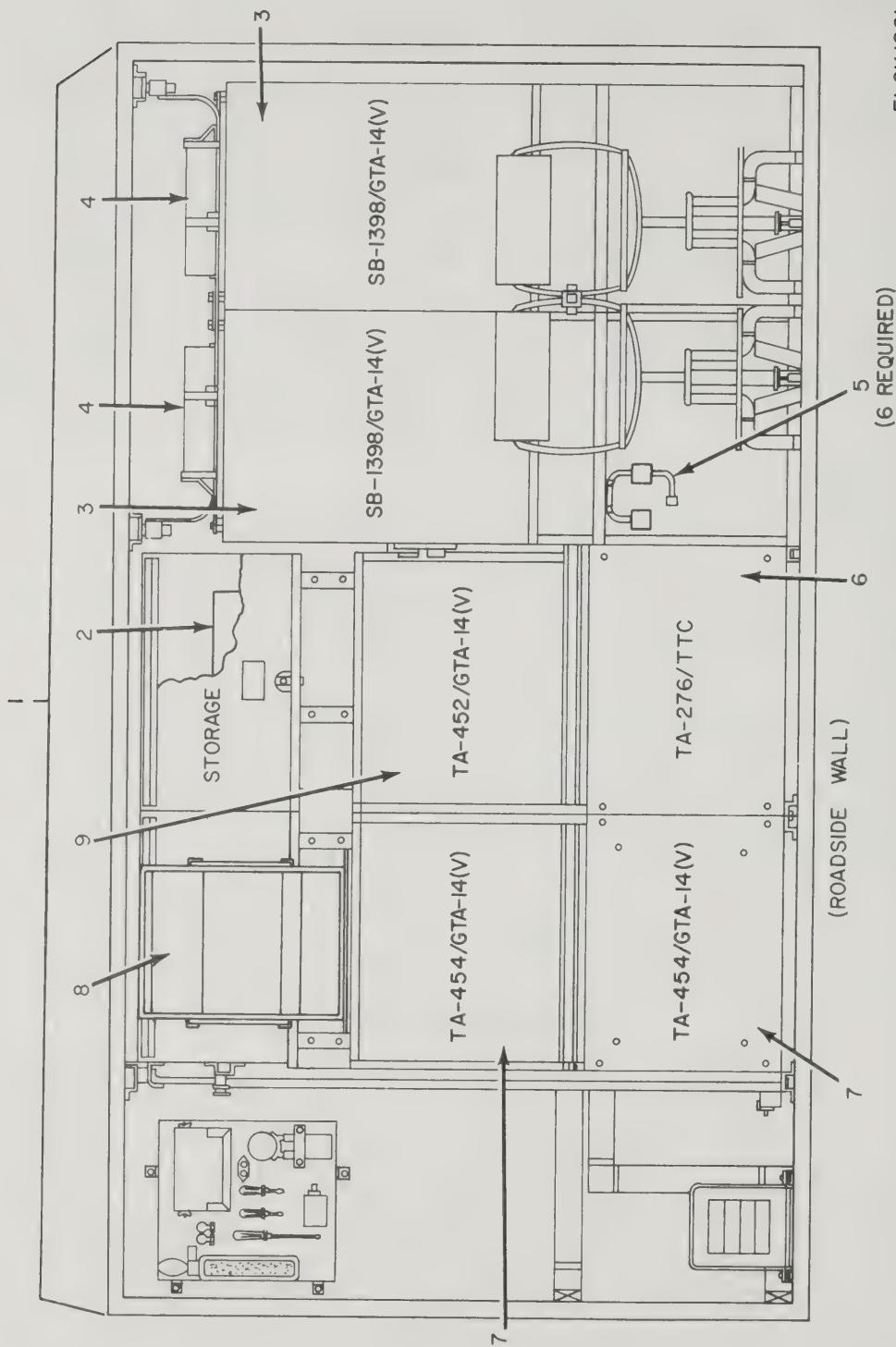


Figure 1. Central Offices, Telephone Manual AN/TTC-23 and AN/TTC-23A.

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SECTION II

TM11-5805-391-15C3

(1) ILLUSTRATION		(2)		(3)	(4)	(5)	(6) DESCRIPTION		(7)		(8)	
(a) FIG NO	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM				QTY INC	QTY IN		
									U/M	UNIT		
							GROUP 00 CENTRAL OFFICES,TELEPHONE MANUAL					
							AN/TTC-23 AND AN/TTC-23A					
1	1	PDDDD	5805-00-930-9302	S376TTC23	80058	SHELTER FACILITY			EA	1		
							GROUP 01 SHELTER FACILITY S-376/TTC-23					
1	2	PDDDD	5825-00-691-3066	TS1361/G	80058	TEST SET,TELEPHONE			EA	1		
1	3	PDDDD	5805-00-892-1080	S81398GTA14V	80063	SWITCHBOARD,TELEPHONE,MANUAL			EA	2		
1	4	PDDDD	6110-00-985-7574	J1077AU	81349	DISTRIBUTION BOX J1077AU			EA	2		
1	5	PDDDD	5965-00-892-1068	H210G	81349	HEADSET-MICROPHONE H210G			EA	6		
1	6	PDDDD	5805-00-503-3347	TA276ATC	80058	TELEPHONE CIRCUIT,TRUNK RELAY			AQ6	EA	1	
1	7	PDDDD	5805-00-503-3347	TA276A	80058	TELEPHONE CIRCUIT,TRUNK RELAY			5KM	EA	2	
1	7	PDDDD	5805-00-855-9823	TA454GTA14V	80058	MAIN DIST FR TEL TA454GTA14V			EA			
1	8	PDDDD	5805-00-069-8795	CV1548/G	80063	CONVERTER,TELEPHONE SIGNAL			AQ6	EA	1	
1	9	PDDDD	5805-00-855-9821	TA452GTA14V	80058	TELEPHONE CIRCUIT,LINE RELAY			AQ6	EA	1	

0-5 Change 4

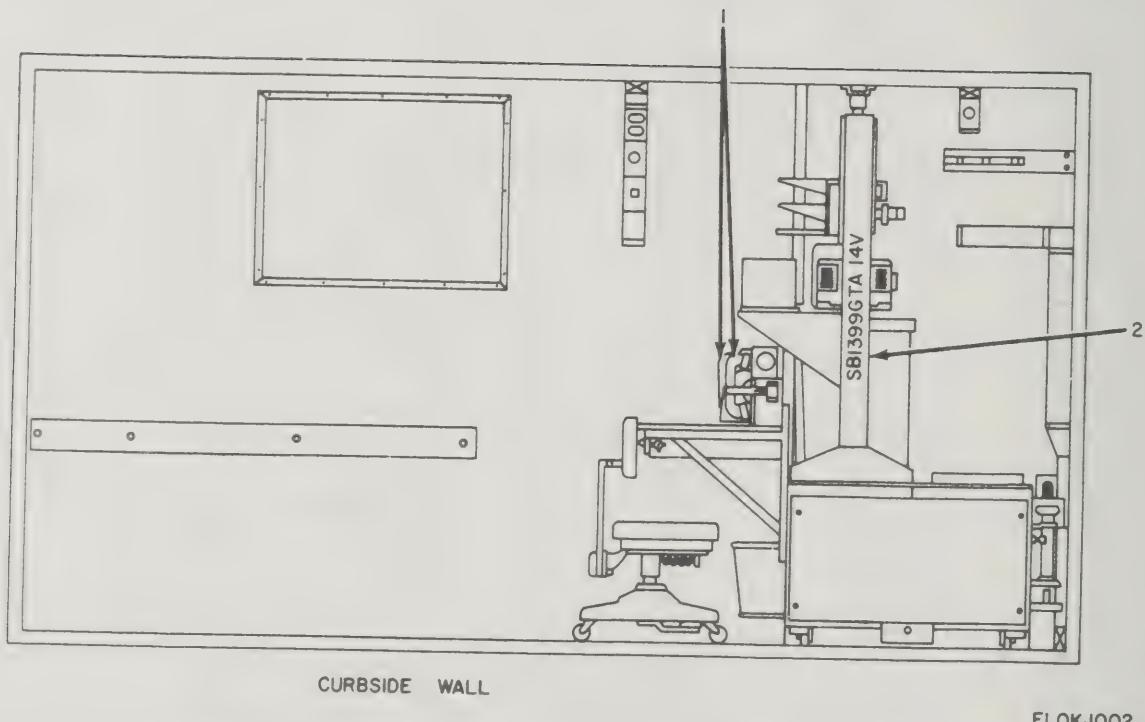


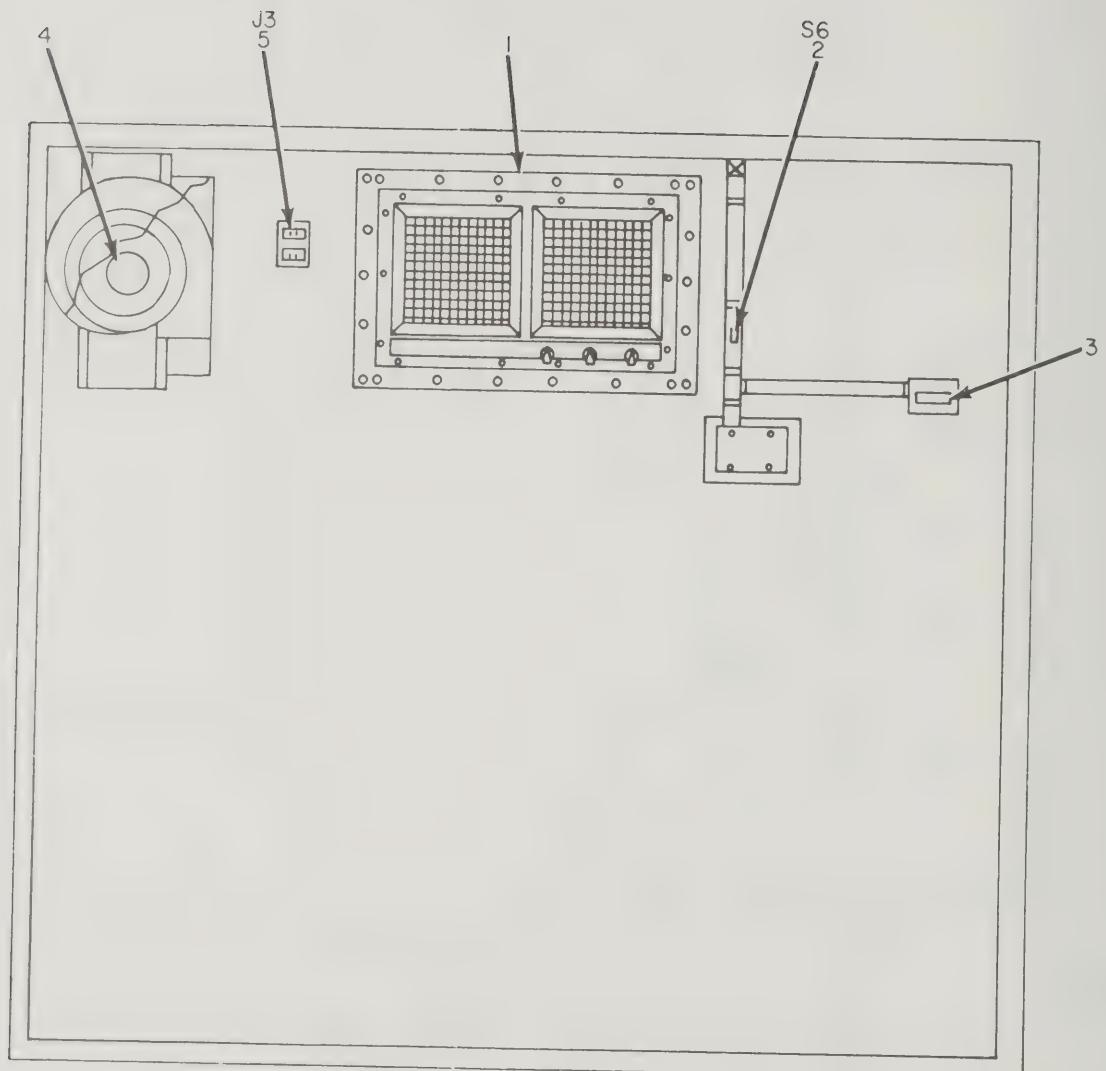
Figure 2. Shelter Facility S-376/TCC-23, Curbside Wall.

SECTION II

TM11-5805-391-15C3

ILLUSTRATION (a) FIG NO.	ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	QTY IN IN U M UNIT	
							(7)	(8)
2	1	PDC00	5805-00-543-0012	TA312PT	80058	TELEPHONE SET TA312PT	EA	2
2	2	PDUDD	5805-00-856-0048	SB1399GTA14V	80063	PANEL,PWR DISTR SB1399GTA14V	EA	1

D-7 Change 4



(FRONT WALL ELEVATED)

ELOKJ003

Figure 3. Shelter Facility S-376/TTC-23, Front Wall.

SECTION II

ILLUSTRATION (1)	(2)	(3)	(4)	(5)	DESCRIPTION	QUANTITY	
						UNITS ON CART	QTY IN CART
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSQM		
3	1	P0000	4123-00-679-2665	F-9000-2	94833	AIR CONDITIONER	EA 1
3	2	PACZZ	5930-00-258-5549	2140	79725	SWITCH, TUGGLE	EA 1
3	3	PACZZ	6685-00-911-6344	T47381036	27319	THERMOSTAT	EA 1
3	4	PACZZ	6105-00-111-2546	SC0539615-2	80063	MOTOR, ELECTRICAL	EA 1
3	5	PA0ZZ	5935-00-928-7861	73108	74545	CONNECTOR, RECEPTACLE, ELECTRICAL	EA 1

D-9 Change 4

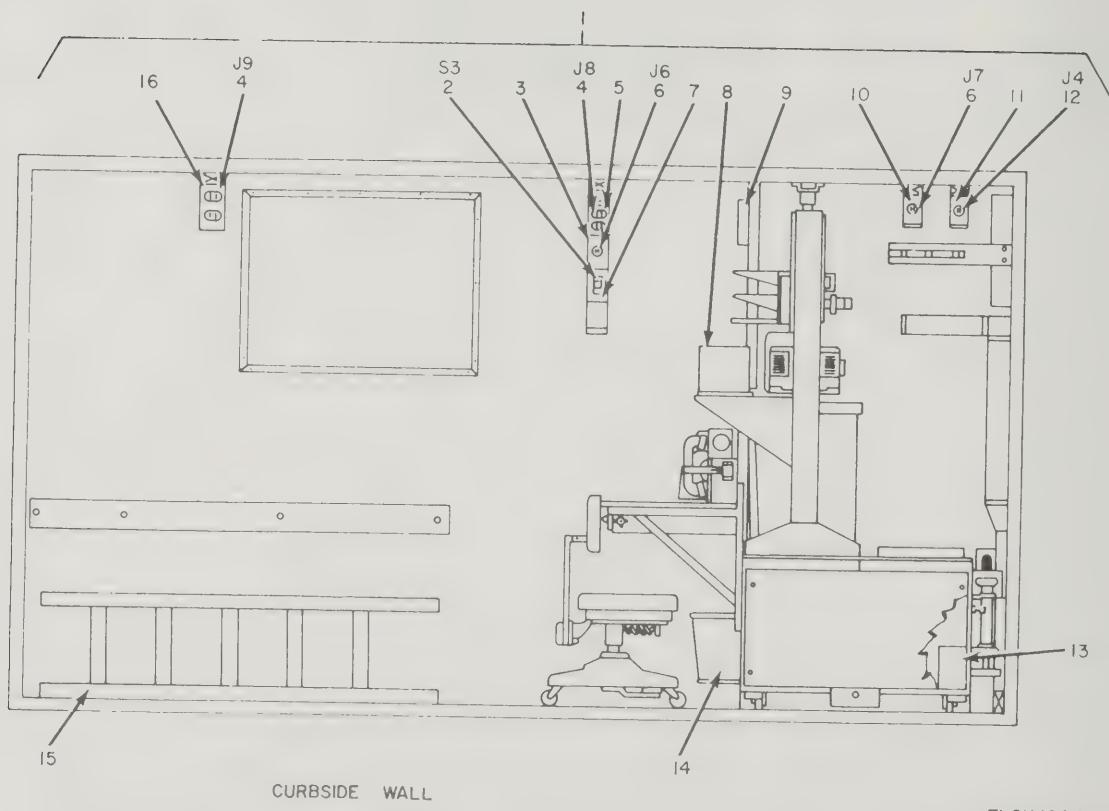


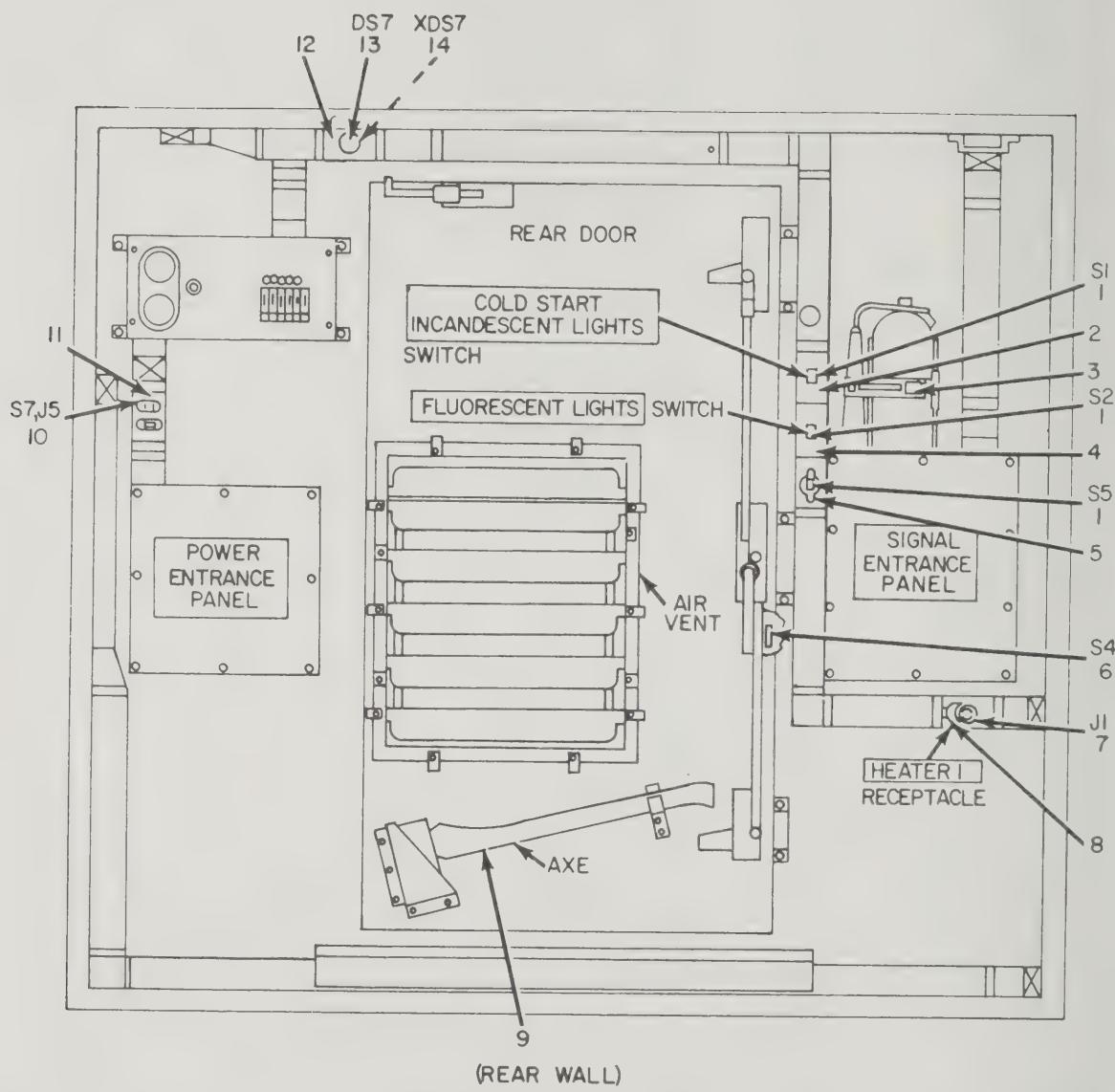
Figure 4. Shelter Facility S-376/TTC-23, Curbside Wall, Additional Parts Location.

ELOKJ004

SECTION II

(1) ILLUSTRATION (e) FIG NO	(2) ITEM NO	NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) (8)	
						QTY INC IN UNIT U/M	USABLE ON CODE
4	1	P000D	5410-00-999-6022	S-280A/G	80058	SHELTER,ELECTRICAL EQUIPMENT	EA 1
4	2	PA0ZZ	5930-00-865-6101	5521-1	03497	SWITCH,TOGGLE	EA 1
4	3	XDOZZ		SCB582530	80063	PLATE, WALL, ELECTRICAL	EA 1
4	4	PA0ZZ	5935-00-283-4003	5262	74545	CONNECTOR,RECEPTACLE ELECTRICAL	EA 2
4	5	XDOZZ		SCB582527	80063	COVER,ELECTRICAL OUTLET	EA 1
4	6	PA0ZZ	5935-00-350-1834	5261	74545	CONNECTOR,RECEPTACLE,ELECTRICAL	EA 2
4	7	XDOZZ		SCB582673	80063	COVER,ELECTRICAL SWITCH	EA 1
4	8	PDCDD	5830-00-752-5357	LS147CFI	80058	INTERCOMMUNICATION STATION	EA 1
4	9	PA0ZZ	6645-00-410-2395	SCC539475	80063	CLOCK,AIRCRAFT,MECHANICAL	EA 1
4	10	XDOZZ		SCB539580	80063	COVER,ELECTRICAL OUTLET	EA 1
4	11	XDOZZ		SCB582528	80063	COVER,ELECTRICAL OUTLET	EA 1
4	12	PA0ZZ	5935-00-929-0301	WC596STYLEJ1	81348	CONNECTOR,RECEPTACLE ELECTRICAL	EA 1
4	13	PA0ZZ	4140-00-816-0601	DRFPKS1504-92AS 60CLOCK BLASTCCW	82877	BLOWER ASSEMBLY	EA 1
4	14	PA0ZZ	7520-00-159-4863	SCD539454	80063	BASKET,WASTE PAPER	EA 1
4	15	PA0ZZ	2540-00-892-6243	MX3391G	80058	LADDER,VEHICLE,BOARDING	EA 1
4	16	XDOZZ		SCB547195-2	80063	COVER,ELECTRICAL OUTLET	EA 1

D-11 Change 4



ELOKJ005

Figure 5. Shelter Facility S-376/TTC-23, Rear Wall.

ILLUSTRATION		SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	DISABLE ON CODE		QTY INC IN U/M UNIT
(1) (a) FIG NO	(2) (b) ITEM NO						(7)	(8)	
5	1	PACZZ	5930-00-865-6101	5521-1	08806	SWITCH, TOGGLE			EA 3
5	2	XDOZZ		SCB582525	80063	COVER, ELECTRICAL SWITCH			EA 1
5	3	PAOZZ	4210-00-288-6849	RB1	33525	BRACKET, FIRE EXTINGUISHER			EA 1
5	4	XDOZZ		SCB547200	80063	COVER, ELECTRICAL SWITCH			EA 1
5	5	XDOZZ		SCB547199	80063	COVER, ELECTRICAL SWITCH			EA 1
5	6	PACZZ	5930-00-944-1086	BZ2RQ181T	91929	SWITCH, SENSITIVE			EA 1
5	7	PAOZZ	5935-00-933-3454	5361	74545	CONNECTOR, RECEPTACLE, ELECTRICAL			EA 1
5	8	XDOZZ		SCB539581-1	80063	COVER, ELECTRICAL OUTLET			EA 1
5	9	PACZZ	5110-00-115-5049	SCC539451	80063	AXE, SINGLE BIT			EA 1
5	10	PAOZZ	5935-00-999-6934	5225	75582	SWITCH AND RECEPTACLE ASSEMBLY			EA 1
5	11	XDCZZ		SCB582529	80063	COVER, ELECTRICAL OUTLET AND SWITCH			EA 1
5	12	XDOZZ		SCB582526	80063	COVER, ELECTRICAL OUTLET			EA 1
5	13	PACZZ	6240-00-299-5876	NE34	81349	LAMP, GLCM			EA 1
5	14	PACZZ	6250-00-299-6562	4109	74545	LAMPHOLDER			EA 1

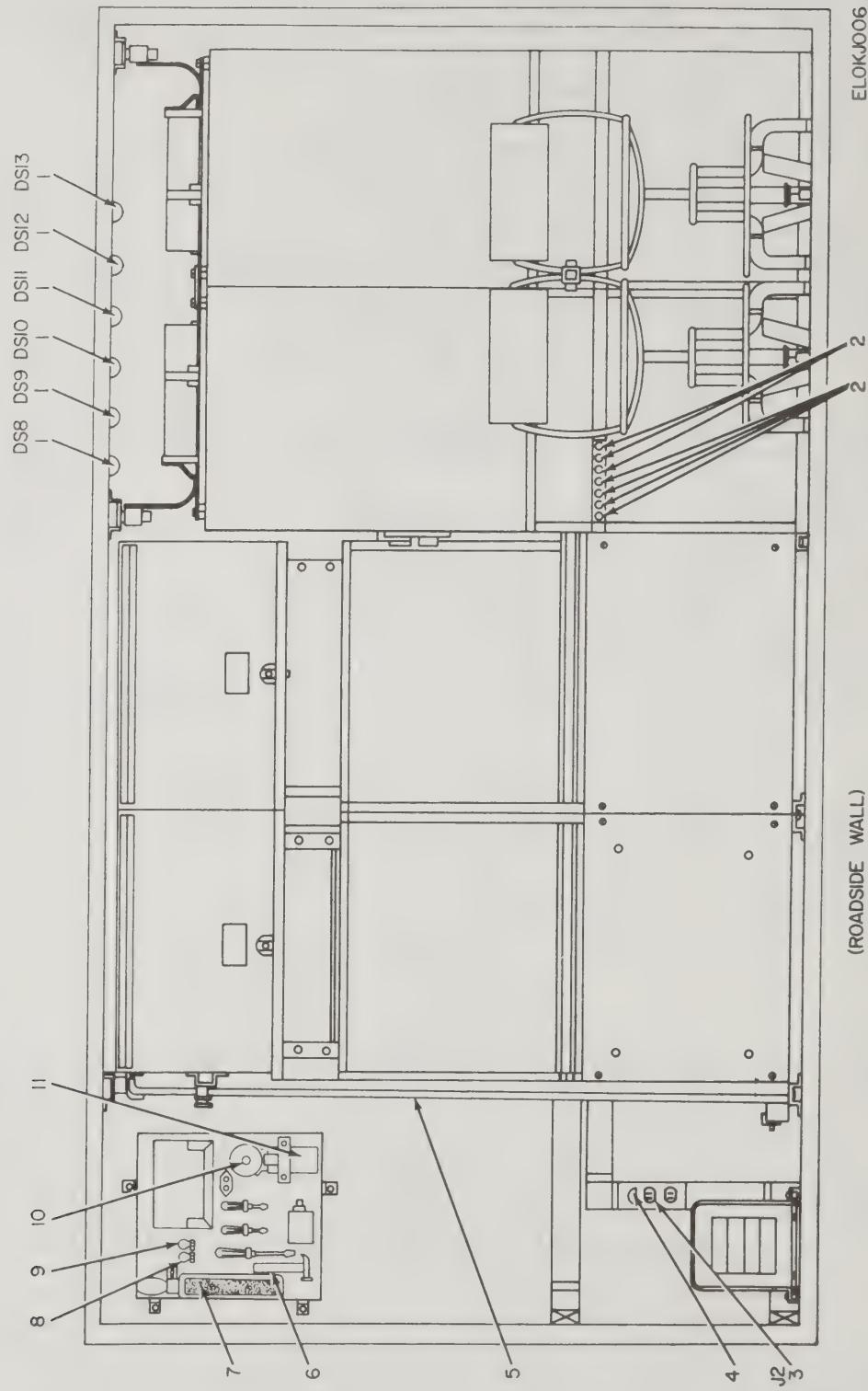


Figure 6. Shelter Facility S-376/TTC-23, Roadside Wall.

ELOKJ006

SECTION II

TM11-5805-391-15C3

(1) ILLUSTRATION (a) FIG NO	(2) ITEM NO	SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) QTY INC IN UNIT U/M	
							USABLE ON CODE	
6	1	PACZZ	6240-00-155-8725	1204	08806	LAMP,INCANDESCENT	EA	6
6	2	PAOZZ	5935-00-224-4213	JJ024	14100	JACK,TELEPHONE	EA	7
6	3	PAOZZ	5935-00-933-3454	5361	74545	CONNECTOR,RECEPTACLE,ELECTRICAL	EA	1
6	4	XDOZZ		SCB539581-2	80063	COVER,ELECTRICAL OUTLET	EA	1
6	5	PAOZZ	5975-00-224-5260	MX-148/G	80058	ROD,GROUND MX-148/G	EA	1
6	6	PAOZZ	5120-00-900-6096	SCC539505	80063	HAMMER,HAND	EA	1
6	7	PAOZZ	7920-00-342-4621	SCC539469	80063	BRUSH,DUSTING,BENCH	EA	1
6	8	PAOZZ	5120-00-293-2696	SCD539547	80063	EXTRACTOR,ELECTRON TUBE	EA	1
6	9	PAOZZ	5120-00-293-2692	SCB539548	80063	EXTRACTOR,ELECTRON TUBE	EA	1
6	10	PACZZ	6240-00-155-7786	PR2	08806	LAMP,INCANDESCENT	EA	1
6	11	PACZZ	6230-00-729-9614	SCC539491	80063	LANTERN,ELECTRIC	EA	1

D-15 Change 4

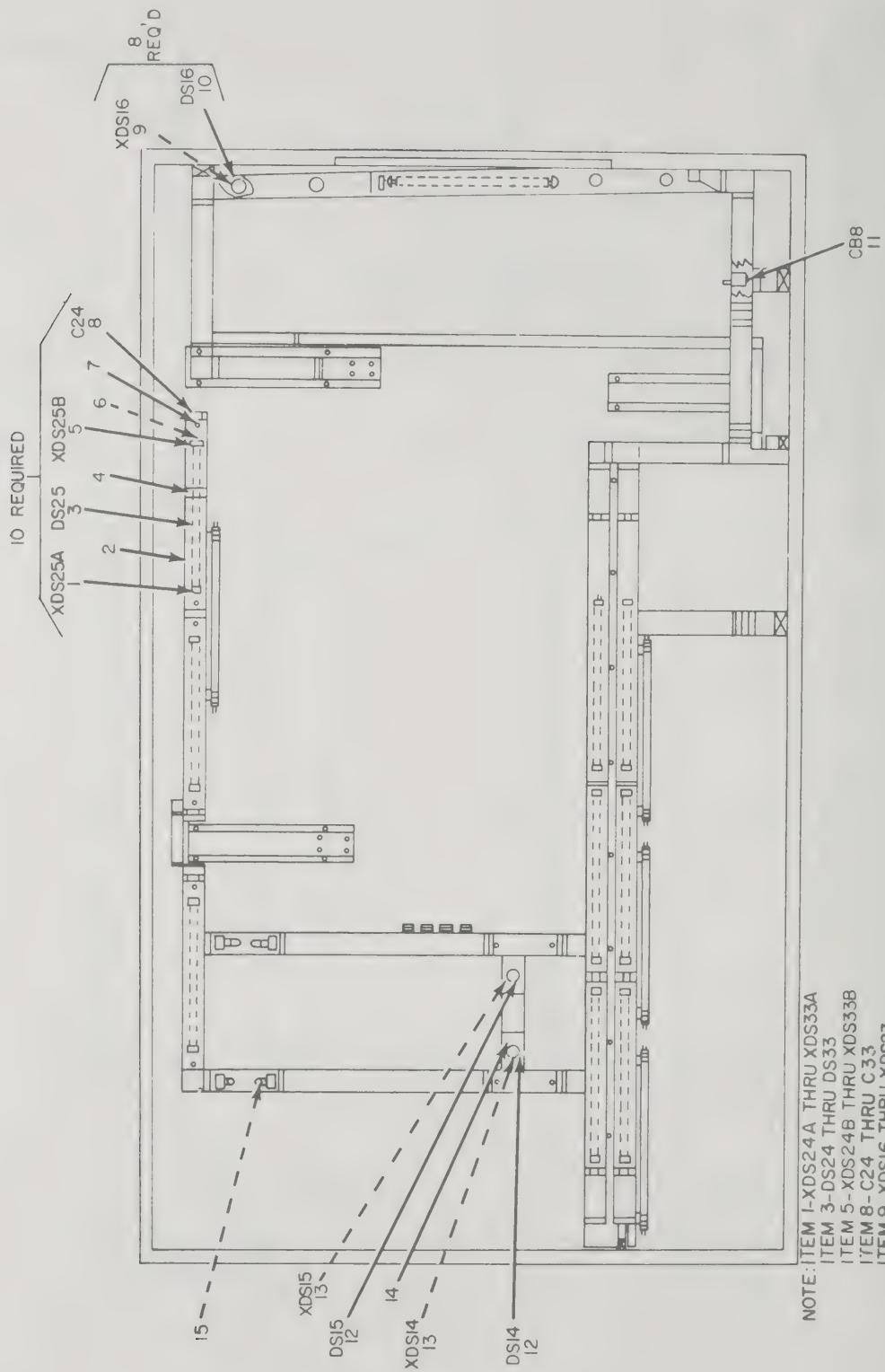


Figure 7. Shelter Facility S-376/TTC-23, Ceiling Plan.

ELOKJ007

SECTION II

TM11-5805-391-15C3

ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY INC IN UNIT
USABLE ON CODE								
7	1	PAOZZ	6250-00-175-2559	78X491	24446	LAMPHOLDER	EA	10
7	2	PACZZ	6210-00-921-6682	SCC539466	80063	SHIELD,FLUORESCENT LAMP	EA	10
7	3	PACZZ	6240-00-152-2996	SCC539495	80063	LAMP,FLUORESCENT	EA	10
7	4	PACZZ	6210-00-757-9694	P40	19634	RETAINER,LAMP	EA	20
7	5	PACZZ	6250-00-227-0317	78X736N	04314	LAMPHOLDER	EA	10
7	6	PACZZ	6250-00-194-4794	SCB539504	80063	STARTER,FLUORESCENT LAMP	EA	10
7	7	PAOZZ	6250-00-804-3449	89G457	08595	BALLAST,LAMP	EA	10
7	8	PAOZZ	5910-00-553-6096	SCC33033-4	80063	CAPACITOR,FIXED,PAPER	EA	10
7	9	PAOZZ	6250-00-995-9074	12-240	95263	LAMPHOLDER	EA	8
7	10	PACZZ	6240-00-155-8653	MS15548-1	96906	LAMP,INCANDESCENT	EA	8
7	11	XDOZZ		SM3-5A57	74193	CIRCUIT BREAKER	EA	1
7	12	PACZZ	6240-00-143-7418	25AB	24455	LAMP,INCANDESCENT	EA	2
7	13	PAOZZ	6250-00-299-6562	4109	74545	LAMPHOLDER	EA	3
7	14	XDOZZ		SCB582595	80063	COVER,ELECTRICAL OUTLET	EA	2
7	15	PACZZ	6210-00-930-1217	SCC547186	80063	SHIELD,INCANDESCENT LAMP	EA	4

D-17 Change 4

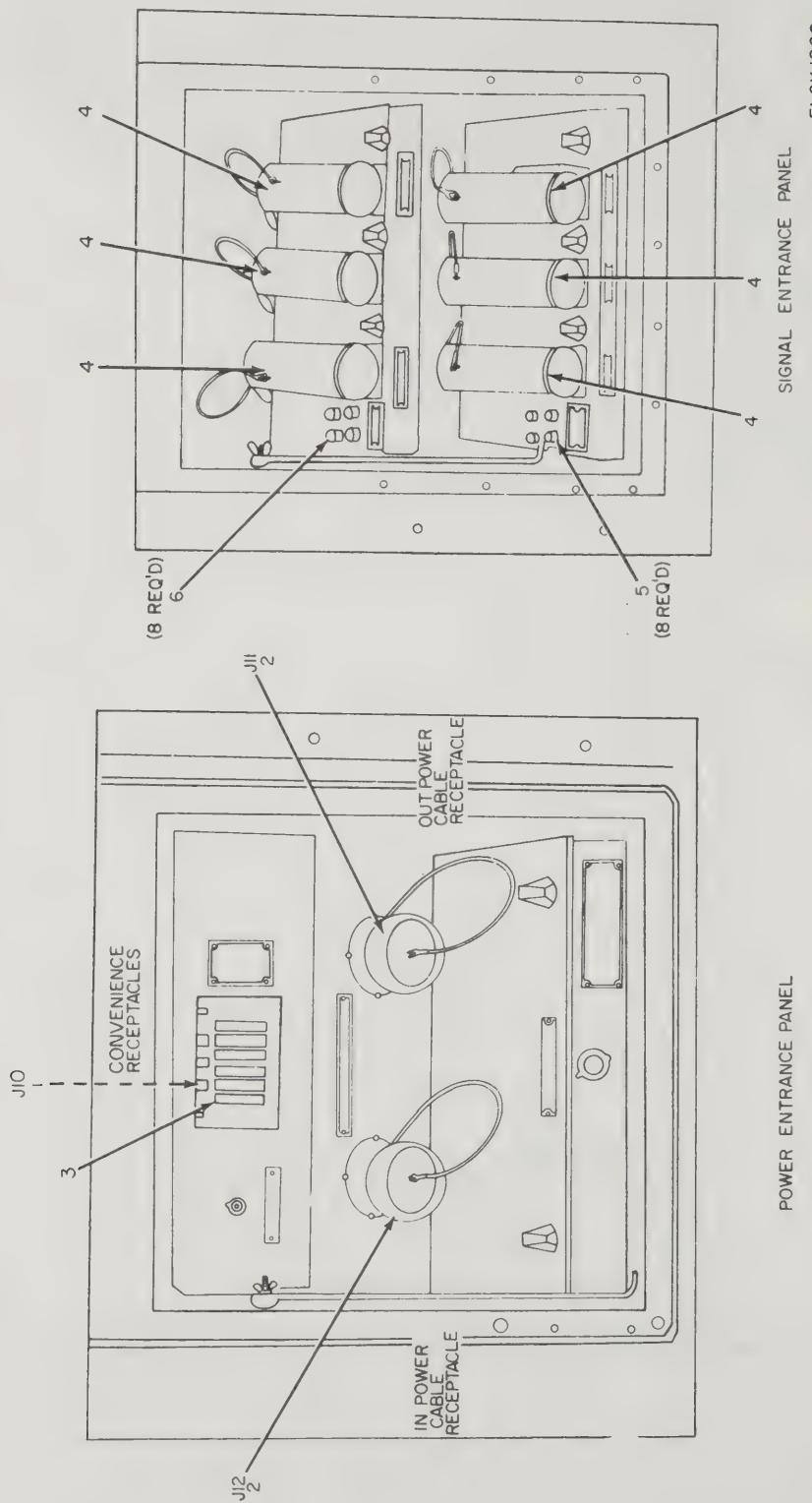


Figure 8. Shelter Facility S-376/TTTC-23, Power and Signal Entrance Panel.

E10KJ008

SECTION II

TM11-5805-391-15C3

(1) ILLUSTRATION		(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSQM	(6) DESCRIPTION	(7) QTY IN U.M	(8) INC IN UNIT
USABLE ON CODE								
8	1	PACZZ	5935-00-283-4003	5262	74545	CONNECTOR,RECEPTACLE,ELECTRICAL	EA	1
8	2	PAOZZ	5935-00-064-5732	U2388G	80058	CONNECTOR,RECEPTACLE,ELECTRICAL	EA	2
8	3	XDOZZ	5975-00-947-3068	M3780FS	21873	COVER,ELECTRICAL OUTLET	EA	1
8	4	PAOZZ	5935-00-045-9832	U187AG	80058	CONNECTOR,RECEPTACLE,ELECTRICAL	EA	6
8	5	PAOZZ	5940-00-283-5386	U106U	80058	POST,BINDING,U106U	EA	8
8	6	PAOZZ	5970-00-869-6263	SCC76202-1	80063	CAP,ELECTRICAL	EA	8

D-19 Change 4

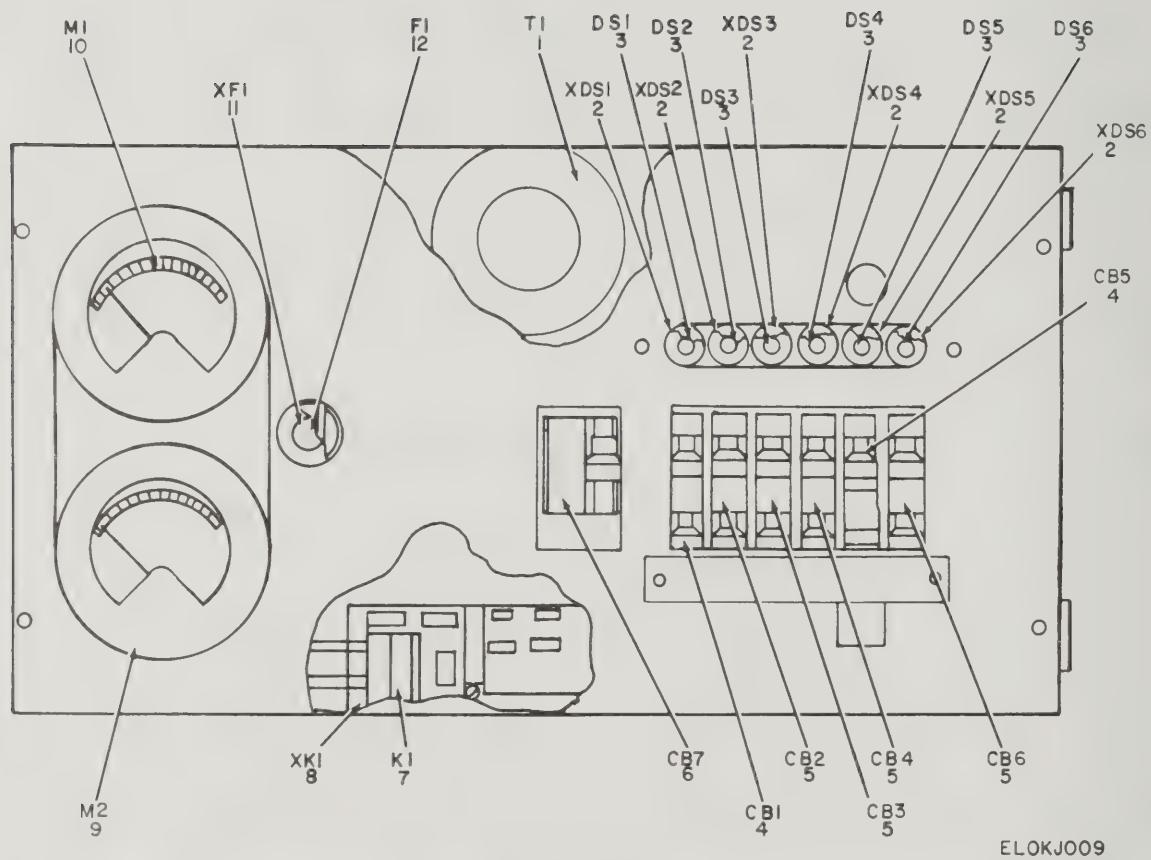


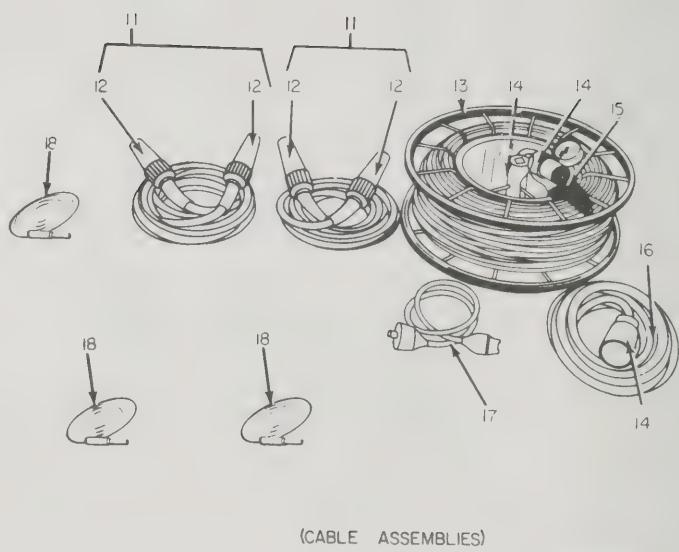
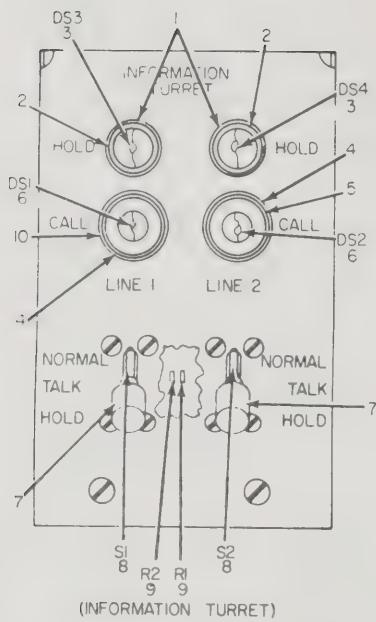
Figure 9. Shelter Facility S-376/TTC-23, Power Distribution Panel.

SECTION II

TM11-5805-391-15C3

ILLUSTRATION						(6)				(7)	
(a) FIG NO	(b) ITEM NO	NATIONAL STOCK NUMBER		PART NUMBER		DESCRIPTION		USABLE ON CODE		QTY INC IN U.M UNiT	
SMR CODE											
9	1	PACZZ	5950-00-892-8208	3CT11B	93993	TRANSFORMER,CURRENT				EA	1
9	2	PAOZZ	6210-00-087-4248	37-0408-0331-245	72619	LAMPHOLDER				EA	6
9	3	PACZZ	6240-00-223-9100	NE51	72619	LAMP,GLOW				EA	6
9	4	PAOZZ	5925-00-818-4811	Q0115	90211	CIRCUIT BREAKER				EA	2
9	5	PALZZ	5925-00-583-7941	Q0120	90211	CIRCUIT BREAKER				EA	4
9	6	PAOZZ	5925-00-785-9531	Q0260	90211	CIRCUIT BREAKER				EA	1
9	7	PAOZZ	5945-00-787-3668	KRP11AG115VAC	77342	RELAY,ARMATURE				EA	1
9	8	PAOZZ	5935-00-129-9358	TS101P02	81349	SOCKET,ELECTRON TUBE				EA	1
9	9	PAOZZ	6625-00-669-5019	MR36W150ACVVR	81349	VOLTMETER				EA	1
9	10	PAOZZ	6625-00-752-8464	MR36W100ACAAR	81349	AMMETER				EA	1
9	11	PACZZ	5920-00-878-5191	344125PA	75915	FUSEHOLDER				EA	1
9	12	PACZZ	5920-00-284-9493	FU2GR125A	81349	FUSE,CARTRIDGE				EA	1

D-21 Change 4



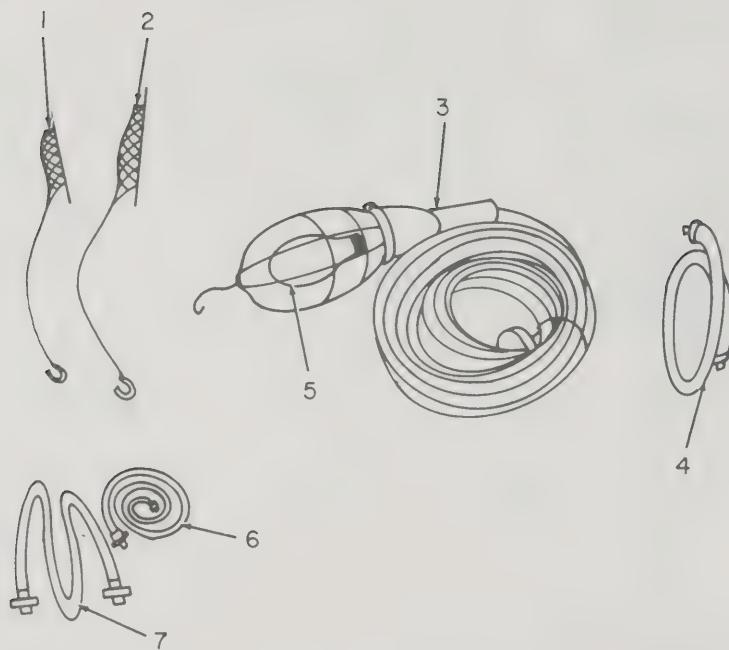
ELOKJOIO

Figure 10. Shelter Facility S-376/TTC-23, Information Turret and Cables.

SECTION II

(1) ILLUSTRATION (a) FIG NO	(2) (b) ITEM NO.	NATIONAL STOCK NUMBER SMR CODE	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
10	1	XDOZZ	95408H000	72619	LIGHT, INDICATOR	EA	2
10	2	PACZZ	6210-00-825-2550	33-111	LENS, INDICATOR, LIGHT	EA	2
10	3	PACZZ	6240-00-223-9100	NE51	LAMP, GLOW	EA	2
10	4	PAOZZ	6210-00-079-6375	33-0428-01-306	LIGHT, INDICATOR	EA	2
10	5	PACZZ	6210-00-548-0157	95-931	LENS, INDICATOR, LIGHT	EA	1
10	6	PACZZ	6240-00-715-0037	48C2	80365 LAMP, INCANDESCENT	EA	2
10	7	PAOZZ	5930-00-548-6747	6541-000	14200 KNOB	EA	2
10	8	PAOZZ	5930-00-636-1484	209764	14100 SWITCH, LEVER	EA	2
10	9	PAOZZ	5905-00-279-1761	RC20GF621J	81349 RESISTOR, FIXED, COMPOSITION	EA	2
10	10	PACZZ	6210-00-295-2207	95-933	72619 LENS, INDICATOR, LIGHT	EA	1
10	11	PAC00	5995-00-985-7571	CX-4566A/U	80058 CABLE ASSEMBLY, TELEPHONE	EA	2
10	12	PAOZZ	5935-00-045-9830	U1858U	80058 CONNECTOR, PLUG, ELECTRICAL	EA	4
10	13	PAOZZ	8130-00-656-1050	RC435U	80058 REEL, CABLE	EA	1
10	14	PAOZZ	5935-00-134-5266	U2378G	80058 CONNECTOR, PLUG, ELECTRICAL	EA	3
10	15	PAC00	5995-00-134-7159	CX7453AUANDRC435U	80063 CABLE ASSEMBLY, POWER, ELECTRICAL	EA	1
10	16	PAC00	5995-00-935-2686	CX7705AU15FT	80058 CABLE ASSEMBLY, POWER, ELECTRICAL	EA	1
10	17	PACZZ	5995-00-935-2704	SCD543403	80063 CABLE ASSEMBLY, POWER, ELECTRICAL	EA	1
10	18	PACZZ	5995-00-752-2566	SMD383873GP3	80063 CABLE ASSEMBLY, TELEPHONE	EA	3

D-23 Change 4



ELOKJ011

Figure 11. Shelter Facility S-376/TTC-23, Accessories.

SECTION II

(1) ILLUSTRATION	(2) (a) FIG. NO.	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) (8)	
						QTY INC IN UNIT	U/M
11	1	PA0ZZ	5120-00-946-5148	SCB539592	80063 GRIP,CABLE,JAW	EA	6
11	2	PA0ZZ	5120-00-946-5114	SCB539593	80063 GRIP,CABLE,JAW	EA	1
11	3	PACZZ	6230-00-115-2687	SCC539496	80063 LIGHT,EXTENSION	EA	1
11	4	PA0ZZ	6150-00-495-1214	SCB539492	80063 LEAD,ELECTRICAL	EA	1
11	5	PACZZ	6240-00-143-3070	50WRS	24455 LAMP,INCANDESCENT	EA	1
11	6	PA0ZZ	5340-00-016-5576	SCB547271GR1	80063 STRAP ASSEMBLY,TIEDOWN	EA	1
11	7	PA0ZZ	5340-00-016-5669	SCB547271GR4	80063 STRAP ASSEMBLY,TIEDOWN	EA	1

D-25 Change 4

NOTE: LATEST NATIONAL STOCK NUMBER AND PART NUMBER ASSIGNMENTS ARE INCLUDED AT END OF INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5935-00-045-5832	8	4	6625-00-669-5019	9	9
5935-00-064-5732	8	2	4120-00-679-2669	3	1
6105-00-111-2546	3	4	6625-00-691-3066	1	2
6230-00-115-2687	11	3	6230-00-729-9614	6	12
5110-00-115-5049	5	9	5830-00-752-5357	4	8
5535-00-125-9358	9	8	6625-00-752-8464	9	10
5935-00-134-5266	10	14	6210-00-757-9694	7	4
6240-00-143-3070	11	5	5925-00-785-9531	9	6
6240-00-143-7418	7	12	5945-00-787-3068	9	7
6240-00-152-2996	7	3	6250-00-804-3449	7	7
6240-00-155-8653	7	10	5925-00-818-4811	9	4
6240-00-155-8725	6	1			
7520-00-159-4863	4	14			
6250-00-175-2559	7	1	5805-00-856-0048	2	2
6250-00-194-4794	7	6	5930-00-865-6101	5	1
6240-00-223-9100	10	3	5970-00-869-6263	8	6
5575-00-224-5260	6	5	5965-00-892-1068	1	5
6250-00-227-0317	7	5	5805-00-892-1080	1	3
5930-00-258-5549	3	2	2540-00-892-6243	4	15
5505-00-275-1761	10	9	5950-00-892-8208	9	1
5935-00-283-4003	4	4	5120-00-900-6096	6	6
5935-00-283-4003	8	1	6210-00-921-6682	7	2
5540-00-283-5386	8	5	5935-00-928-7861	3	5
5920-00-284-9493	9	12	5935-00-929-0301	6	1
4210-00-288-6849	5	3	6210-00-930-1217	7	15
6210-00-295-2207	10	10	5805-00-930-9302	1	1
6240-00-255-5876	5	13	5935-00-933-3454	5	7
6250-00-299-6562	5	14	5935-00-933-3454	6	3
6250-00-299-6562	7	13	5595-00-935-2704	10	17
7520-00-342-4521	6	13	5930-00-944-1086	5	6
5935-00-350-1834	4	7	5120-00-946-5114	11	2
6645-00-410-2395	4	9	5120-00-946-5148	11	1
6150-00-495-1214	11	4	5975-00-947-3068	8	3
5805-00-543-0012	2	1	6110-00-985-7574	1	4
6210-00-548-C157	10	5			
5930-00-548-6747	10	7	6250-00-995-9074	7	9
5925-00-583-7941	9	5	5410-00-999-6022	4	1
5930-00-636-1484	10	8	5935-00-999-6934	5	10
8130-00-656-1090	10	13			

PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
BZ2RCL181T	91929	5	6	SCB539581-2	80063	6	4
CV1548/G	80063	1	8	SCB539592	80063	11	1
CX-4566A/U	80058	10	11	SCB539593	80063	11	2
F-9CLC-2	94833	3	1	SCB547195-2	80063	4	16
F02GR125A	81349	9	12	SCB547200	80063	5	4
F210G	81349	1	5				
JJC24	14100	6	2	SCB582525	80063	5	2
J1077AL	81349	1	4	SCB582526	80063	5	12
KRP11AG115VAC	77342	9	7	SCB582527	80063	4	5
LS147CFI	80058	4	8	SCB582528	80063	4	11
MR36W100ACAAR	81349	9	10	SCB582529	80063	5	11
MR36W150ACVVR	81349	9	9	SCB582530	80063	4	3
MX3391G	80058	4	15	SCB582595	80063	7	14
M376CF5	21873	8	3	SCC33033-4	80063	4	7
NE34	81349	5	13	SCC539451	80063	5	9
NE51	72619	9	3	SCC539466	80063	7	2
NE51	81349	10	3	SCC539469	80063	6	7
PR2	08806	6	10	SCC539475	80063	4	9
F40	19634	7	4	SCC539491	80063	6	11
SC115	90211	9	4	SCC539495	80063	7	3
SC120	90211	9	5	SCC539496	80063	11	3
SC26C	90211	9	6	SCC539505	80063	6	6
RB1	33525	5	3	SCC547186	80063	7	15
PC20GF621J	81349	10	9	SCC76202-1	80063	8	6
PC435U	80058	10	13				
SB1398GTA14V	80063	1	3	SCD539454	80063	4	14
SB1399GTA14V	80063	2	2	SCD539615-2	80063	3	4
SCB539492	80063	11	4	SCD543403	80063	10	17
SCB539504	80063	7	6				
SCB539546	60063	6	9	SM3-5A57	74193	7	11
SCB539580	80063	4	10	S376TTC23	80058	1	1
SCB539581-1	80063	5	8	T4276TTC	80058	1	1

SECTION IV

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

TM11-5805-391-15C3

PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
TA312PT	80058	2	1	4109	74545	5	14
TA454GTA14V	80058	1	7	4109	74545	7	13
TS101P02	81349	9	8	50WRS	24455	11	5
T1361/G	80058	1	2	5225	75582	5	11
T473B1036	27319	3	3	5261	74545	4	6
U106U	80058	8	5	5262	74545	4	4
U187AG	80058	8	4	5262	74545	8	1
U237BG	80058	10	14	5361	74545	5	7
U238BG	80058	8	2	5521-1	03457	6	2
12-240	95263	7	9	5521-1	08805	1	1
1240	08866	6	1	6541-000	14200	7	5
209764	14100	10	8	7310B	74545	3	5
2140	79725	3	2	78X491	24446	1	1
25AB	24455	7	12	95-931	72619	10	5
3CT11B	93993	9	1	95-933	72619	10	10
33-111	72619	10	2	9540BH000	72619	10	1

LATEST NATIONAL STOCK NUMBER ASSIGNMENTS

STOCK NUMBER	FIG. NO.	ITEM NO.	STOCK NUMBER	FIG. NO.	ITEM NO.
5340-00-016-5576	11	6	5910-00-553-6096	7	8
6210-00-079-6375	10	4	6240-00-715-0037	10	6
5340-00-079-6375	11	7	5995-00-752-2566	10	18
6210-00-087-4248	9	2	4140-00-816-0601	4	13
5995-00-134-7159	10	15	6210-00-825-2550	10	2
6240-00-155-7786	6	10	5930-00-865-6101	4	2
6240-00-223-9100	9	3	5920-00-878-5191	9	11
5120-00-293-2692	6	9	6685-00-911-6344	3	3
5120-00-293-2696	6	8	5995-00-935-2686	10	16
5805-00-503-3347	1	6	5995-00-985-7571	10	11

LATEST PART NUMBER ASSIGNMENTS

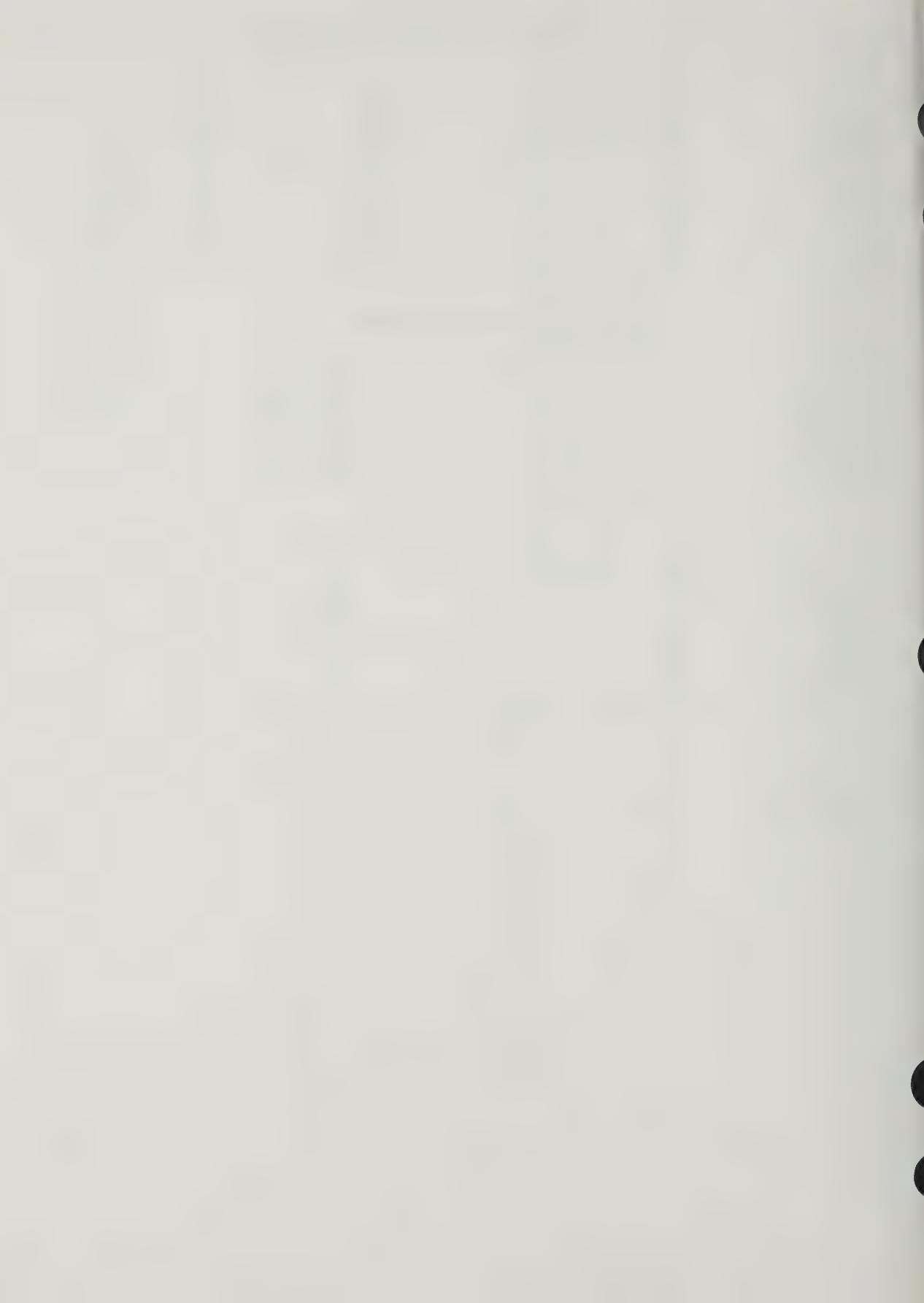
PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
CX7453AUANDRC435U	80063	10	15	S280A/G	80058	4	1
CX7705AU15FT	80058	10	16	TA276ATTC	80058	1	6
DRFPKS1504-92AS60	82877	4	13	WC596STYLEJ1	81349	4	12
CLOCKBLASTCCW				33-0428-01-306	72C19	10	4
MS15548-1	96906	7	10	344125PA	75915	9	11
MX148G	80058	6	5	37-0408-0331-245	72619	9	2
SCB547271GR1	80063	11	6	48C2	80365	10	6
SCB547271GR4	80063	11	7	78X736N	04314	7	5
SCD539547	80063	6	8	89G457	08595	7	7
SM383873GP3	80063	10	18				

ADDITIONAL LATEST NATIONAL STOCK NUMBER ASSIGNMENTS

STOCK NUMBER	FIG. NO.	ITEM NO.
5935-00-045-9830	10	12
5805-00-069-8795	1	8
5935-00-224-4213	6	2
5805-00-503-3347	1	6
5805-00-855-9823	1	7

ADDITIONAL LATEST PART NUMBER ASSIGNMENTS

PART NUMBER	FSCM	FIG. NO.	ITEM NO.
TA276ATTC	80058	1	5
U185BU	80058	10	12



APPENDIX E

DEPOT MAINTENANCE FINAL PERFORMANCE TESTING CENTRAL OFFICE, TELEPHONE, MANUAL AN/TTC-23 AND AN/TTC-23A

E-1. General

This final performance test procedure is provided so that the depot having a maintenance overhaul requirement for Central Office, Telephone, Manual AN/TTC-23 and AN/TTC-23A can verify the satisfactory performance of the equipment after the overhaul function is complete.

E-2. Initial Conditions

The final performance test on all major components of the AN/TTC-23 and AN/TTC-23A should have been successfully performed before assembly into the end item and the execution of this procedure.

E-3. Test Equipment

The following test equipment is required:

- a. Megohmmeter, ME-213A/U, 1 ea.
- b. Multimeter, AN/USM-223, 1 ea.

WARNING

The AN/TTC-23 and AN/TTC-23A must be properly grounded before connection of input power.

E-4. Grounding

Using the instructions outlined in paragraph 2-4, ground the shelter at the power entrance panel.

E-5. Power Connection

Using the instructions outlined in paragraph 2-5, connect 115 vac ± 10 vac 60 Hz, single phase power to the POWER 115 vac IN or OUT receptacle located in the power entrance panel.

NOTE

Omit the following signal circuit tests on the information turret and the other operating components.

E-6. Signal Circuit Tests

Refer to the signal schematic diagram (fig. 6-1). Perform the following tests on all wiring shown, including the two MDF's (TA-454/GTA-14(V)) and all interconnecting cables. Also perform the tests on the two maintenance supplied 26 pair telephone cable assemblies (CX-4566A/G).

a. *Continuity Test.* Using the multimeter, perform a point-to-point continuity test. Measured resistance shall not exceed 6 ohms. Use a test plug for connection to each jack to check circuit continuity.

b. *Insulation Breakdown/Resistance Test.* Using the

500 volt megohmmeter, perform an insulation breakdown/resistance test between any one conductor and all the rest (including ground) at connectors SIGNAL 1 through SIGNAL 6 located in the signal entrance panel.

CAUTION

Perform the following test with the vac power removed.

E-7. Ground System Test

Using the multimeter, perform a continuity check between each receptacle ground contact or necessary ground terminal in the power entrance panel. Measured resistance shall be 1/2 ohm or less.

E-8. Panel Meter Test

Test in accordance with TB 11-6625-666-50.

E-9. Blower and Motor Test

Using the impeller as a load, test in accordance with TM 11-6105-200-50.

E-10. Basic Shelter Mechanical Test

Test in accordance with TB 750-240.

E-11. Clock

The clock shall be accurate to an equivalent of 30 seconds per 24-hour period.

E-12. Power Distribution and Operational Functions Test

a. *Operation of Power Distribution Panel.* With power connected, the voltmeter on the panel should read 150 vac ± 10 vac. Neon lamp shall light indicating power is connected to the shelter.

b. *Test of Circuit Breaker No. 1.*

(1) Place circuit breaker No. 1, wire chief's night light, fluorescent, and incandescent switches to the ON position.

(2) Place the blackout bypass switch to the BYPASS position. All lights shall come on.

(3) With shelter door open and the blackout bypass switch in the BLACKOUT position, all lights, except the two blue lights over the switchboards, shall extinguish.

(4) Close the shelter door and note that all lights shall come on except that the two blue lights shall extinguish.

(5) Open shelter door; place blackout bypass switch in the BYPASS position. All lights shall

come on. Leave switch in this position for remainder of tests.

(6) Operate circuit breaker No. 1 to assure lights are controlled by this breaker. Leave breaker in the ON position.

(7) Turn off wire chief's night light and the cold start incandescent switches.

c. Test of Circuit Breaker No. 2 and No. 3.

(1) Place circuit breaker No. 2 to the ON position. Neon lamp shall light.

(2) Place heater No. 1 switch to the FAN position. Heater shall blow cool air.

(3) Set thermostat to maximum temperature range.

(4) Place heater No. 1 switch to the HEAT position. After a short time the heater shall blow warm air.

(5) Lower thermostat setting until a "click" is heard. This is the thermostat contact and can be verified by observing a current drop on the power distribution panel connector. The fan shall continue to operate.

(6) With heater fan blowing, operate circuit breaker No. 1 to verify that it controls heater No. 1. Leave breaker in the OFF position.

(7) Repeat steps (1) through (6) for circuit breaker No. 3 and heater No. 2.

d. Test of Circuit Breaker No. 4.

(1) Place circuit breaker No. 4 to the ON position. Neon lamp shall light.

(2) Set wall thermostat sufficiently low to permit sensing a higher temperature.

(3) Set air-conditioner thermostat to maximum cooling. Place switch to the FAN position. Fan shall blow air.

(4) Place switch to the COOL position. Compressor shall come on. This can be verified by observing an increase in current reading on the power distribution panel connector. After a short time the air-conditioner shall blow cold air.

(5) Increase set point of wall thermostat to a temperature higher than inside shelter temperature. Air-conditioner shall stop.

(6) Reset wall thermostat to start air-conditioner. With air-conditioner running, operate circuit breaker No. 4 to verify that it controls the air-conditioner. Leave breaker in the OFF position.

e. Test of Circuit Breaker No. 5.

(1) Place circuit breaker No. 5 to the ON position. Neon lamp shall light.

(2) Remove battery exhaust plug from battery exhaust vent on the exterior of the shelter.

(3) Plug battery exhaust blower power cord into battery exhaust outlet. Observe that air is being exhausted through the vent to the exterior of the shelter.

(4) Operate circuit breaker No. 5 to verify that it controls the battery exhaust blower.

(5) With a test lamp plugged into the equipment

outlet on curbside, operate circuit breaker No. 5 to verify that it controls this outlet. Leave breaker in the OFF position.

f. Test of Circuit Breaker No. 6

(1) Place circuit breaker No. 6 to the ON position. Neon lamp shall light.

(2) Open exhaust blower louver located on bottom of blower housing on exterior of shelter.

(3) Place exhaust blower switch to the ON position. Blower shall exhaust shelter air.

(4) Operate circuit breaker No. 6 to verify that it controls the blower. Place exhaust blower switch to the OFF position.

(5) Plug the intercom power cord into the intercom outlet. Turn intercom on. The power On lamp shall light.

(6) Operate circuit breaker No. 6 to verify that it controls the intercom.

(7) Plug a test lamp into convenience outlet No. 1 (curbside wall) and No. 2 (roadside wall). Test lamp shall light.

(8) Operate circuit breaker No. 6 to verify that it controls these outlets.

(9) Repeat (7) and (8) above for the duplex outlet in power entrance panel. Leave breaker in the OFF position.

g. Emergency Light Test.

(1) Install 48-volt batteries or the equivalent.

(2) Place emergency light circuit breaker, located in conduit between power distribution panel and the SB-1399/GTA-14(V) to the ON position.

(3) Throw main breaker to the OFF position (simulates loss of 115 vac power). All lights shall extinguish and the emergency lights shall come on.

(4) Place emergency light circuit breaker to the OFF position. Throw the main breaker to the ON position. Emergency lights shall remain extinguished. Leave the main breaker in the ON position.

E-13. Systems Operation Test

a. Power Distribution Panel Test.

(1) Plug the power distribution panel into the equipment receptacle and place the circuit breaker to the ON position.

(2) Place the 48-vdc circuit breaker (on top panel) to the ON position. There shall be no indication of alarms, buzzers, etc., within the shelter.

(3) Place the 110-vac circuit breaker (on top panel) to the ON position.

(4) Turn the FINE and COURSE knobs (on lower panel) to the lowest settings.

(5) Place the AC INPUT breaker (on lower panel) to the ON position. Pilot light shall come on.

(6) Place the DC OUTPUT breaker (on top panel) to the ON position.

(7) Adjust the COURSE and FINE knobs until 48 vdc is obtained on meter.

(8) Place the TELERING breakers (on top panel) to the ON position. Place the EMERGENCY-RING-TELERING breaker to the TELERING position.

(9) Measure for approximately 48 vdc between any fuse and ground at each trunk and live relay rack. Note that ground is positive.

(10) Measure for approximately 48 vdc between any fuse and ground at the switchboards.

(11) Measure for approximately 100 vac at the 20 Hz ringing plugs connected to each switchboard.

(12) Measure for approximately 115 vac at the AC plugs connected to each switchboard.

(13) Check each heater in the switchboard to verify that they are heating.

(14) Carefully depress the tabs of each fuse on the line relay rack, trunk relay rack and switchboards. Buzzer alarm shall sound when each tab is depressed.

b. Supervisory Lamps Test.

(1) Place the ANS cord plug half way into the recall jack. Supervisory lamp shall light.

NOTE

The recall jack is located in the lower right corner of the switchboard face.

(2) Insert ANS cord plug completely into recall jack. Supervisory lamp shall extinguish.

(3) Repeat (1) and (2) above for all ANS and CALL cords. All lamps shall function.

c. Dial Test.

(1) Place the first RING-ANS-DIAL switch, starting from left of No. 1 switchboard, to the locked position (No. 1 switchboard is unit nearest door end).

(2) With the multimeter set for R x 1 scale reading, place meter leads between sleeve and ground of first (from left) CALL cord plug.

(3) Dial zero and hold the dial at this position. Resistance reading shall not exceed 8 ohms.

(4) Release dial. When dial returns to normal, multimeter shall read infinity.

(5) Return the RING-ANS-DIAL switch to its normal position.

(6) Repeat (1) through (5) above for all fifteen plugs.

(7) With the multimeter set for R x 10 scale reading, place meter leads between tip and ring of first (from left) CALL cord plug.

(8) Place RING-ANS-DIAL switch to the locked position. A reading of 500 ohms shall be obtained.

(9) With meter leads still across tip and ring, dial zero and hold the dial at this position. Resistance reading shall not exceed 10 ohms.

(10) Repeat (7), (8), and (9) above for all fifteen plugs.

(11) With the multimeter set for R x 10 scale, place

meter leads between tip and ring of any CALL cord plug. Operate RING-ANS-DIAL switch to the locked position. Throw DIAL-WIPEOUT switch to the WIPE-OUT position. A reading of infinity shall be obtained.

(12) With the multimeter set for R x 1 scale, place meter leads across sleeve and ground of any CALL cord plug. Resistance reading shall not exceed 8 ohms when DIAL-WIPEOUT switch is in the WIPEOUT position.

(13) Repeat (1) through (12) above for switchboard No. 2.

d. CB Line Circuit Test.

(1) Place all CB-LB switches, located on the line relay rack, to the CB position.

(2) Place the NA switch at each line relay rack to the ON position.

(3) Connect a CX-4566A/U cable between a distribution box (J-1077A/U) and signal connector No. 1 in the signal entrance panel. Make this same cable hookup using the remaining J-1077A/U and signal connector No. 3.

(4) Connect a telephone (TA-312/PT), arranged for CB operation, to binding post pair No. 1 of a J-1077 A/U. Connect another TA-312/PT to binding post No. 1 of the other J-1077A/U. These phones will be referred to as phone No. 1 and phone No. 2 respectively in the following tests.

(5) Connect a headset to one of the headset receptacles on the face of the key shaff at operator's position No. 1 (nearest entrance door). Connect a headset in a similar manner to operator's position No. 2 (nearest front wall).

(6) Lift phone No. 1. Line lamp No. 1 on face equipment shall light. The night alarm shall ring.

NOTE

The night alarm may be muted since repeated operation will occur during test of all lines.

(7) Insert ANS cord into jack associated with the lighted line lamp. The lamp shall extinguish and the night alarm shall stop ringing.

(8) Place the RING-CALL-TALK switch to the ANS position. Communications through phone No. 1 and operator's headset shall be loud and clear.

(9) Repeat (6), (7), and (8), above for phone No. 2 except use the CALL cord. Communications shall be loud and clear.

(10) Replace phone No. 1 and phone No. 2 in their cradles. The CALL supervisory lamp and the ANS supervisory lamp shall light.

(11) Momentarily operate both RING-CALL-TALK and RING-ANS-DIAL switches to the RING position. Phone No. 1 and phone No. 2 shall ring. CALL cord must be in.

(12) Withdraw both plugs from the jacks on the face equipment. All lamps shall extinguish.

(13) Repeat (6) through (12) above at operator's

position No. 2.

(14) Repeat (6) through (13) above for all lines. Use all ANS and CALL cords at each operator's position until each is verified as satisfactory.

(15) After completion of tests for signal connectors No. 1 and No. 3, move cable to signal connectors No. 2 and No. 4 and repeat (6) through (14) above with the following exceptions:

(a) Use of all ANS and CALL cords is not required.

(b) At any convenient time, utilize the remaining two headset receptacles on the face of the key shelf.

(c) At any convenient time, temporarily place TELERING-EMERGENCY RING breaker to the EMERGENCY RING position. Turn on emergency ring circuit breaker. A complete operation sequence of the two phones shall be possible.

(16) After completion of test for signal connectors No. 2 and No. 4 connect a cable between signal connector No. 5 and a J-1077A/U.

(17) Connect phone No. 1 to binding post pair No. 1 and phone No. 2 to binding post No. 11 of the J-1077A/U.

(18) Repeat (6) through (14) above for signal connector No. 5.

(19) Leave all connections unchanged after completing test.

e. Hand Ringing Generator Test.

(1) Place the RINGING-KEY-HAND switch on switchboard No. 1 face equipment to the HAND position.

(2) Insert CALL cord plug into jack No. 1 (signal connector No. 5). Lift handset of phone No. 1 momentarily to assist operator in location of jack.

(3) Place the RING-CALL-TALK switch to the RING position.

(4) Turn hand crank on the switchboard shelf. Phone No. 1 shall ring. Return RINGING-KEY-HAND switch to the KEY position and remove plug.

(5) Repeat (1) through (4) above for switchboard No. 2. Leave all connections unchanged after completing test.

f. Monitor-Master-Ringing Test.

(1) Operate the RING-CALL-TALK (first from left) switch to the RING position.

(2) Place MONITOR-MASTER RINGING switch to the locked position.

(3) Place RING-CALL-TALK switch to the TALK position.

(4) Place POSITION-GROUPING switch to the locked position.

(5) Communication between phone No. 2 and switchboard No. 2 operator shall be loud and clear. Remove cord plug and return all switches to normal position. Leave all connections unchanged after completing test.

g. Monitor Test.

(1) Lift handset of phone No. 1. Lamp at jack No. 1 on face equipment shall light.

(2) Insert ANS cord plug into jack No. 1 at switchboard No. 1.

(3) Place RING-CALL-TALK switch to the TALK position.

(4) Operator at switchboard shall give a long count. Phone No. 1 operator shall not be able to hear count when MONITOR-MASTER-RINGING switch is placed in the MONITOR position by the switchboard operator.

(5) Remove ANS cord plug and return all switches to normal position.

(6) Repeat (1) through (5) above for switchboard No. 2.

h. Conference Call Test.

(1) Lift handset of phone No. 1. Lamp at jack No. 1 on face equipment shall light.

(2) Insert ANS cord plug into jack No. 1 at switchboard No. 1.

(3) Place RING-CALL-TALK switch to the TALK position.

(4) Phone No. 1 operator and switchboard operator shall be in communication.

(5) Place CALL cord plug into first conference jack (lowest row, right half of face equipment) at switchboard No. 1.

(6) Insert second ANS cord plug into second conference jack.

(7) Lift handset of phone No. 2 and insert CALL cord plug associated with second ANS cord into jack on face equipment that lights. Place second RING-CALL-TALK switch to the TALK position. Communication between switchboard and phones, and between phones shall be loud and clear.

(8) Place RING-CALL-TALK switches to the normal position. Communication between phones still exists.

(9) Remove plug from second conference jack and place in third conference jack. Communications between phones still exists. Place RING-CALL-TALK switch to the TALK position. Communications between switchboard and phones still exists.

(10) Repeat repositioning of CALL cord plug until all nineteen conference jacks are verified for loud and clear communications.

(11) Repeat (1) through (10) above for switchboard No. 2.

i. LB Line Circuit Tests.

(1) Place all CB-LB switches on the line relay rack to the LB position.

(2) Arrange phone No. 1 and phone No. 2 for LB operation.

(3) Perform the same sequence of operations as

outlined in d(1) through (19) for CB line circuit tests with the following differences:

(a) Both phones will require hand ringing to signal switchboard and for ring down when calls are completed.

(b) Magneto supervisory lamps will light in lieu of supervisory ANS and CALL lamps when ring down is accomplished at phones No. 1 and No. 2.

j. Trunk Circuit Tests.

(1) Place all idle lamp control switches, on the TA-276/TTC rack, to the ON position. Each idle trunk lamp on face equipment shall light.

(2) Reposition switches so only LIGHTS 1 and 11 on both switchboards remain on.

(3) Arrange the idle trunk hookup as shown in figure E-1.

(4) Place first (extreme left) CALL cord plug of switchboard No. 1 into trunk line jack No. 11. Idle lamp for jack No. 11 shall go out and adjacent lamp for jack No. 12 shall light (both switchboards).

(5) Place ANS cord plug of switchboard No. 2 into trunk line jack No. 1. Idle lamp shall extinguish and second idle lamp shall light (both switchboards).

(6) Place RING-CALL-TALK keys of both switchboards to the TALK position. Communication between switchboard headsets shall be loud and clear. Return keys to neutral position.

(7) Temporarily withdraw CALL cord plug from jack. Idle lamp (No. 12) shall go out and lamp at position No. 11 shall come on. ANS supervisory lamp at switchboard No. 2 shall light.

(8) Withdraw ANS cord plug at switchboard No. 2. The ANS supervisory lamp shall go out.

(9) Reinsert CALL cord plug into jack No. 11 to simulate an "in use" trunk.

(10) Repeat (1) through (9) above utilizing CALL cord plugs 12 through 20 (sequentially) on switchboard No. 1 and move connections at J-1077A/U to pairs 2 and 12, 3 and 13, etc.

(11) Repeat (4) through (10) above for switchboard No. 2.

(12) Return connections at J-1077A/U to pairs 1 and 11. Remove all plugs.

(13) Repeat (4) through (10) above using CALL cords at switchboard No. 1, trunks 1 through 10 and ANS cords at switchboard No. 2, trunks 11 through 20.

(14) Repeat (4) through (10) above using CALL cords at switchboards No. 2, trunks 1 through 10 and ANS cords at switchboard No. 1, trunks 11 through 20.

k. Information Turret (Info Phones) Test.

(1) Place cross connection between pairs 98 and 99 of turnk main distribution frame and pairs 98 and 99 of line main distribution frames.

(2) Originate a call from phone No. 1 on a pair at the J-1077A/U (connection should still be to No. 5

signal connector).

(3) Switchboard operator accepts call with ANS cord plug.

(4) Operator inserts CALL cord plug into information line No. 1 jack on face equipment (corresponds to pair 98).

(5) Operator rings information turret position No. 1 at supervisor's desk. CALL light on information turret shall blink.

(6) Place information turret switch in TALK position. Establish communication between the phone outside shelter and info phone No. 1 at desk.

(7) Place information turret switch line No. 1 to HOLD position. Phone No. 1 and supervisor's position shall not be capable of communicating. HOLD light shall light.

(8) Originate a call from phone No. 2 at the J-1077A/U.

(9) Operator places phone No. 2 through to information line No. 2. Phone No. 1 shall not hear conversation.

(10) Place information line No. 2 to the HOLD position. HOLD lamp shall light. Place information turret switch to the TALK position. Operator and phone No. 1 shall resume conversation. Phone No. 2 shall not hear conversation.

(11) Replace information turret switches to NORMAL and withdraw switchboard cords.

l. Intercommunication Station Test.

(1) With a suitable low voltage device, such as a buzzer, check for continuity between terminals 26A and 26B of each connector (signal 1 through signal 6) and the binding posts marked INTERCOM in the signal entrance panel.

(2) Connect and intercommunication station (LS-147C/FI) to the INTERCOM binding posts.

(3) Plug the LS-147C/FI at the supervisor's desk into the INTERCOM jack.

(4) Apply power to both intercom units. POWER ON lamps shall light.

(5) Communication between intercom sets shall be possible.

m. Supervisor's Phone Test.

(1) With a suitable low voltage device, such as a buzzer, check for continuity between terminals 25A and 25B of each connector (signal 1 through signal 6) and the binding posts marked PHONE (SUPERVISOR) in the signal entrance panel.

(2) Connect a telephone (TA-312/PT), arranged for LB operation, to the binding posts marked PHONE in the signal entrance panel.

(3) Arrange the supervisor's phone for LB operation.

(4) Plug the supervisor's phone into the jack marked PHONE. There shall be loud and clear communication

between the two phones.

n. Spare Phone Jacks Test.

(1) Using a low voltage indicating device, verify that pairs 21 through 24 in all six signal connectors, located in the signal entrance panel, are connected in parallel.

(2) Connect the J-1077-A/U to one of the signal connectors in the signal entrance panel.

(3) Connect a telephone, set for LB operation, to pair 21 of the J-1077A/U.

(4) Connect the supervisor's phone, set for LB, to spare jack 21 and establish communications with outside phone.

(5) Repeat (1) through (4) above for remaining spare lines, using corresponding spare jacks and pair of the J-1077A/U.

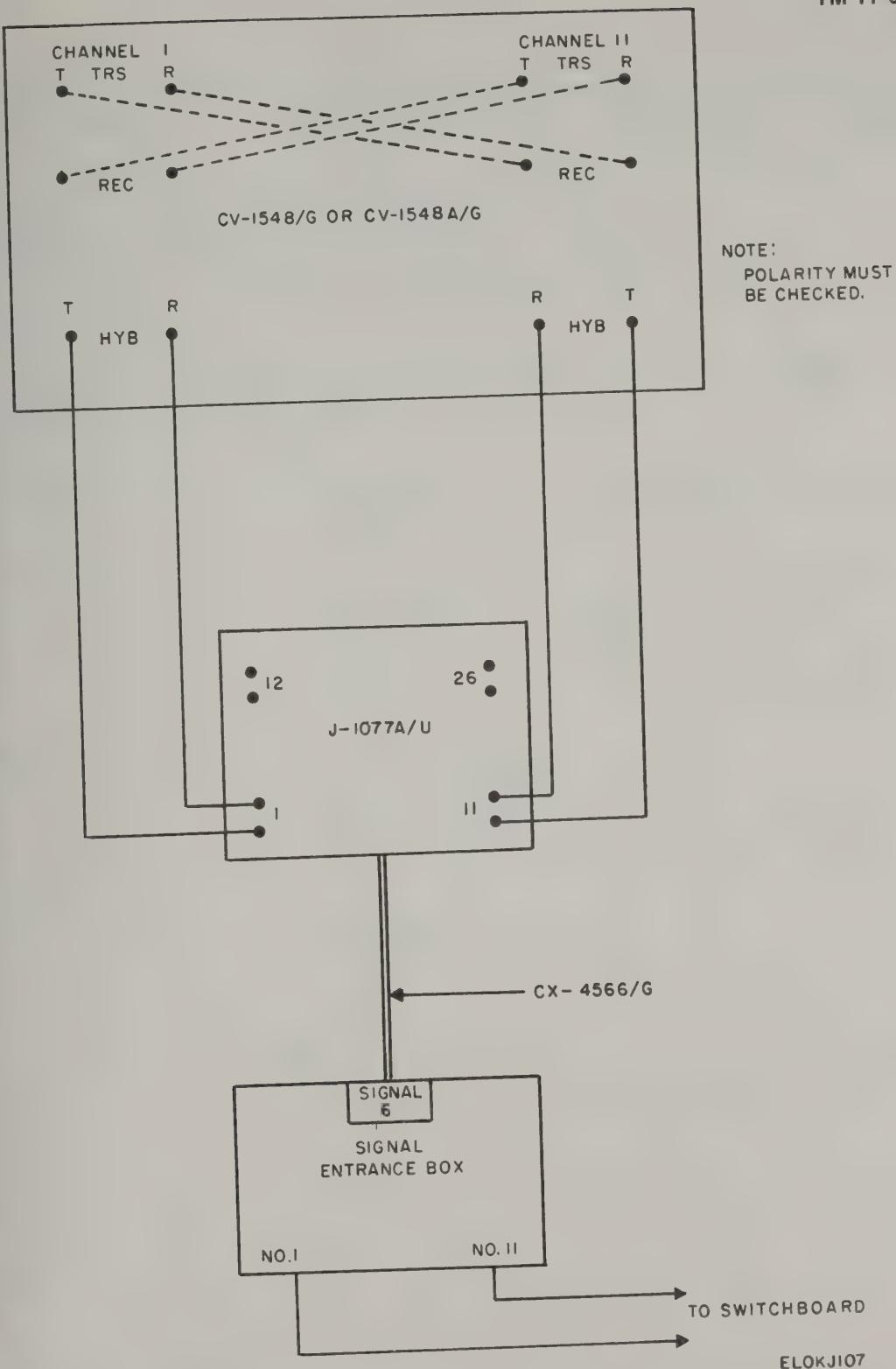


Figure E-1. Idle Lamp Control Trunk Test Hookup.



RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS



SOMETHING WRONG WITH THIS MANUAL?

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

PUBLICATION NUMBER

DATE

TITLE

TM 11-5840-340-12

23 Jan 74

Radar Set AN/PY-76

BE EXACT...PIN-POINT WHERE IT IS

IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	REASON
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.
3-10	3-3	3-1		REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
5-6	5-8			Item 5, Function column. Change "2 db" to "3db."
				REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
				Add new step f.1 to read, "Replace cover plate removed in step e.1, above."
				REASON: To replace the cover plate.
	F03			Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."
				REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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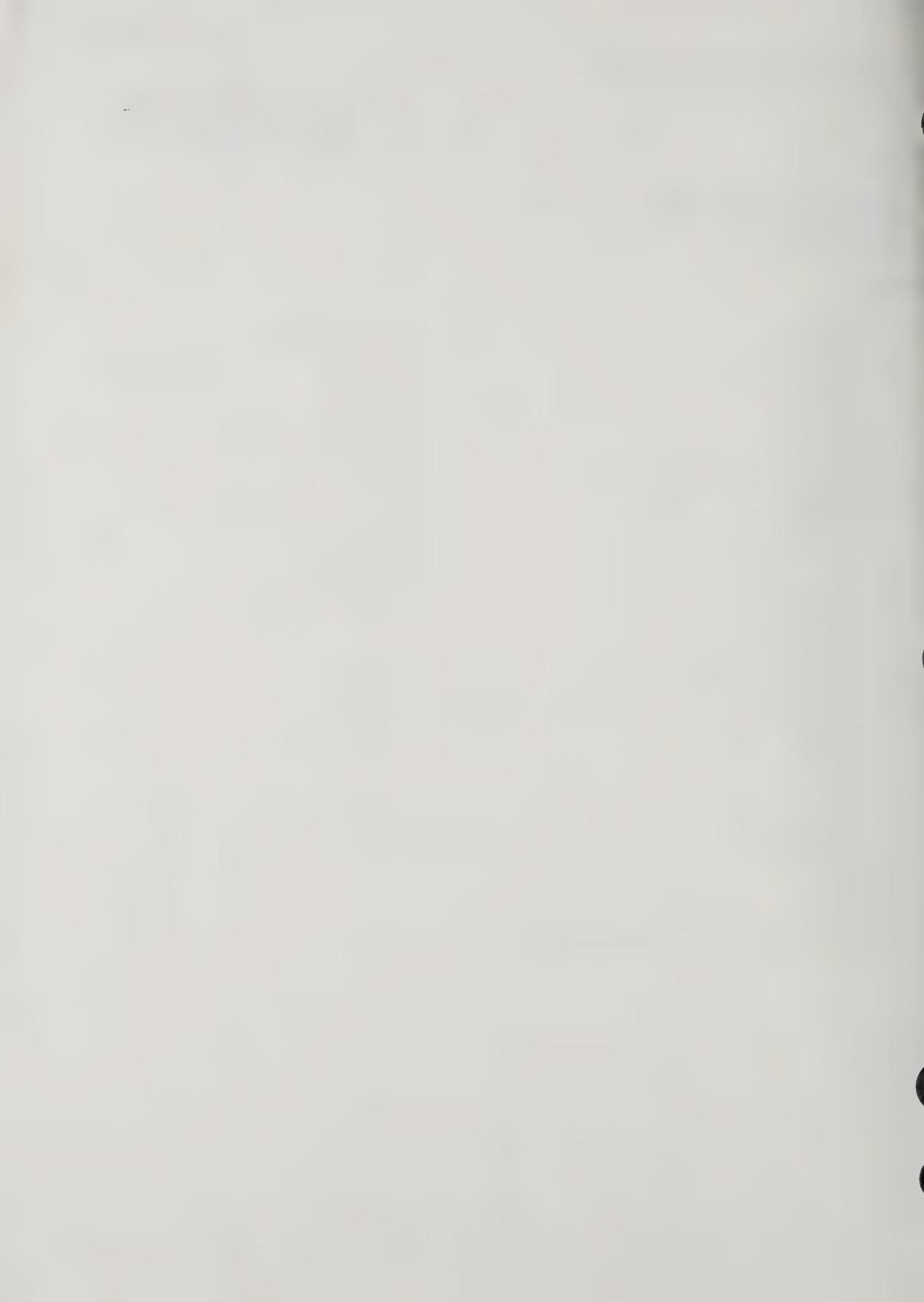
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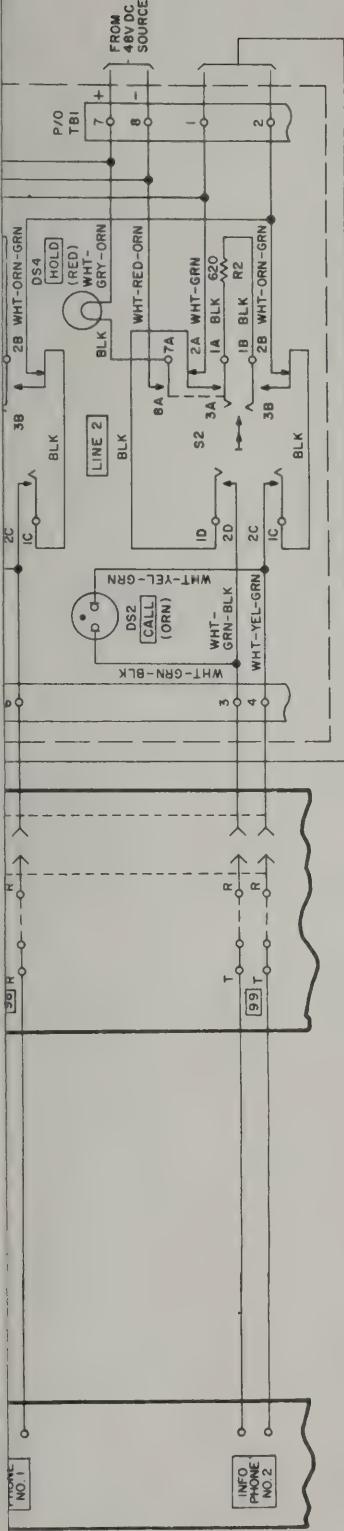
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ARADCOM (2)	USAERDAW (2)
ARADCOM Rgn (1)	Sig FLDMS (1)
OS Maj Comd (2)	Units org under fol TOE:- 2 ea.
USACDCEC (10)	7-55
USACDCCEA (1)	7-175
USACDCCEA (Ft Huachuca) (1)	11-155
USASTRATCOM (2)	11-157
USAESC (70)	11-158
USATECOM (2)	11-205
Armies (1)	11-587
Ft Huachuca (5)	11-592
WSMR (2)	11-597
Ft Carson (7)	29-1
Div (5)	29-7
Svc Colleges (1)	29-42
USASESS (10)	29-134
USAINTS (3)	67-2

ARNG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

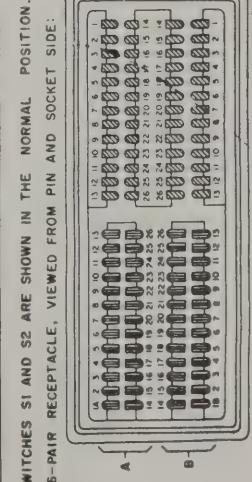




NOTES:

1. INDICATES EQUIPMENT MARKING
2. ONLY FEMALE CONTACTS OF U-187A/G ARE SHOWN. EACH FEMALE CONTACT IS CONNECTED IN PARALLEL WITH A MALE CONTACT
3. **SIGNAL 2** THRU **SIGNAL 5** ARE WIRED THE SAME AS **SIGNAL 1**, EACH WIRE OF EACH CABLE PAIR IS IDENTIFIED BY TA-454/GTA-14(V) BINDING POST NUMBER.
4. CABLING FOR CB-LB LINES 00-09 SHOWN. CB-LB LINES 10-99 ARE IDENTICAL.
5. CABLES ENTER AT POSITION NO. 1 AND MULTIPLE TO POSITION NO. 2.
6. CABLING FOR TRUNKS 1-10 AND 11-20 SAME AS THAT SHOWN FOR CB-LB LINES 00-09.
7. SPARE (UNUSED) LINE PAIRS 21-24 OF **[SIGNAL 1]** THRU **[SIGNAL 5]** ARE CONNECTED IN PARALLEL AT THE LINE SIDE BINDING POSTS OF TA-454/GTA-14(V) NO. 2, PAIR 25 AND 26 (PARALLEL - CONNECTED IN A SIMILAR MANNER FOR **[SIGNAL 1]** THRU **[SIGNAL 5]**).
8. CROSS CONNECTIONS SHOWN WITH CIRCUITS CONNECTED IN NUMERICAL SEQUENCE. CROSS CONNECTIONS MAY BE CHANGED AS NECESSARY TO MEET CIRCUIT REQUIREMENTS.
9. PAIRS 21 THRU 26 ARE NOT CROSS CONNECTED. CROSS CONNECTIONS MAY BE MADE, IF DESIRED; **[INFO PHONE NO 1]** AND **[INFO PHONE NO 2]** CIRCUITS, CONNECTED TO BINDING POSTS 98 AND 99, MAY BE CROSS CONNECTED TO ALLOW FOR SWITCHBOARD APPEARANCE OF INFO LINES.
10. CABLING CHART (NOTE: PAIR NO. 27 OF EACH CABLE IS SPARE PAIR AND IS FOLDED BACK AND SEWN IN CABLE HARNESS.)

CABLE NO.	CABLE PAIRS	MDF NO. 1 B.P.	MDF NO. 2 B.P.
1	1-20 21-26	00-19 20-25	1-20 21-26
2	1-20 21-26	20-39 30-35	20-25 21-26
3	1-20 21-26	40-59 40-45	20-25 21-26



11. SWITCHES S1 AND S2 ARE SHOWN IN THE NORMAL POSITION.
12. 26-PAIR RECEPTACLE, VIEWED FROM PIN AND SOCKET SIDE:

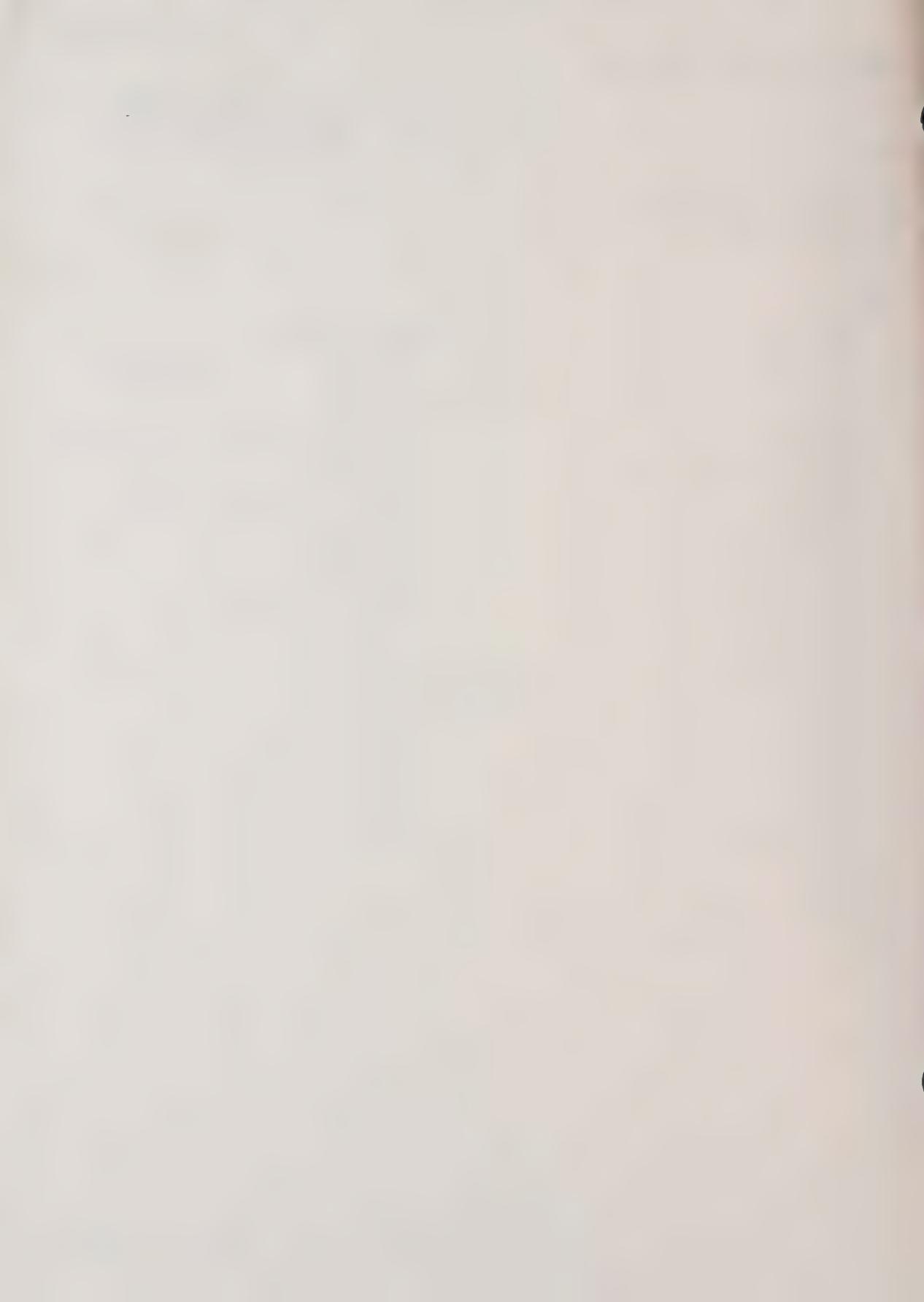
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Change 1

13. 12 TRUNK CIRCUITS CABLED TO TA-454/GTA-14(V), CROSS CONNECT TO ANY OF 20 TRUNKS AT SB-1390/GTA-14(V).

MALE

FEMALE



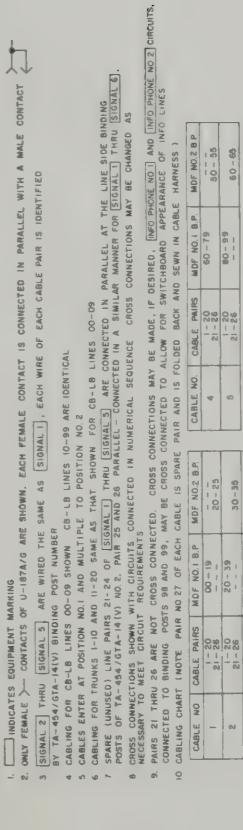
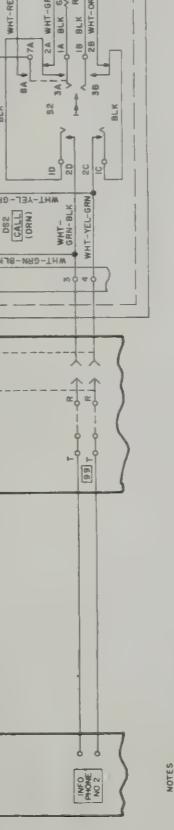
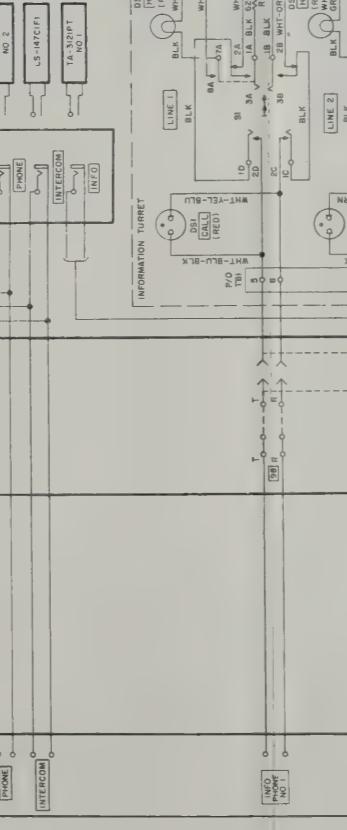
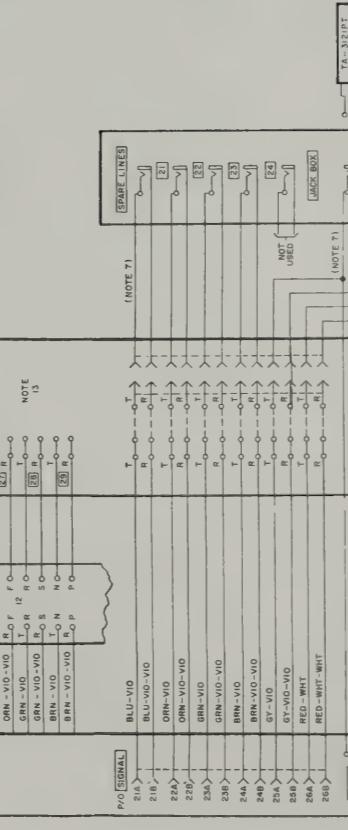
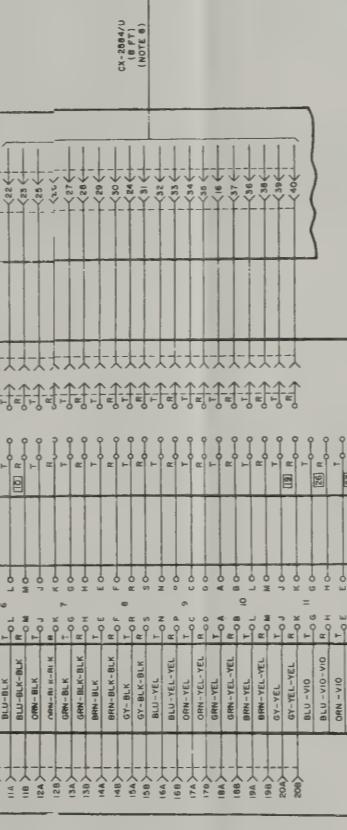
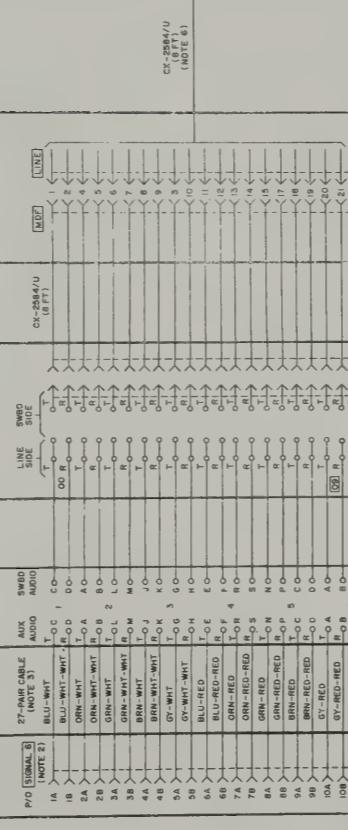
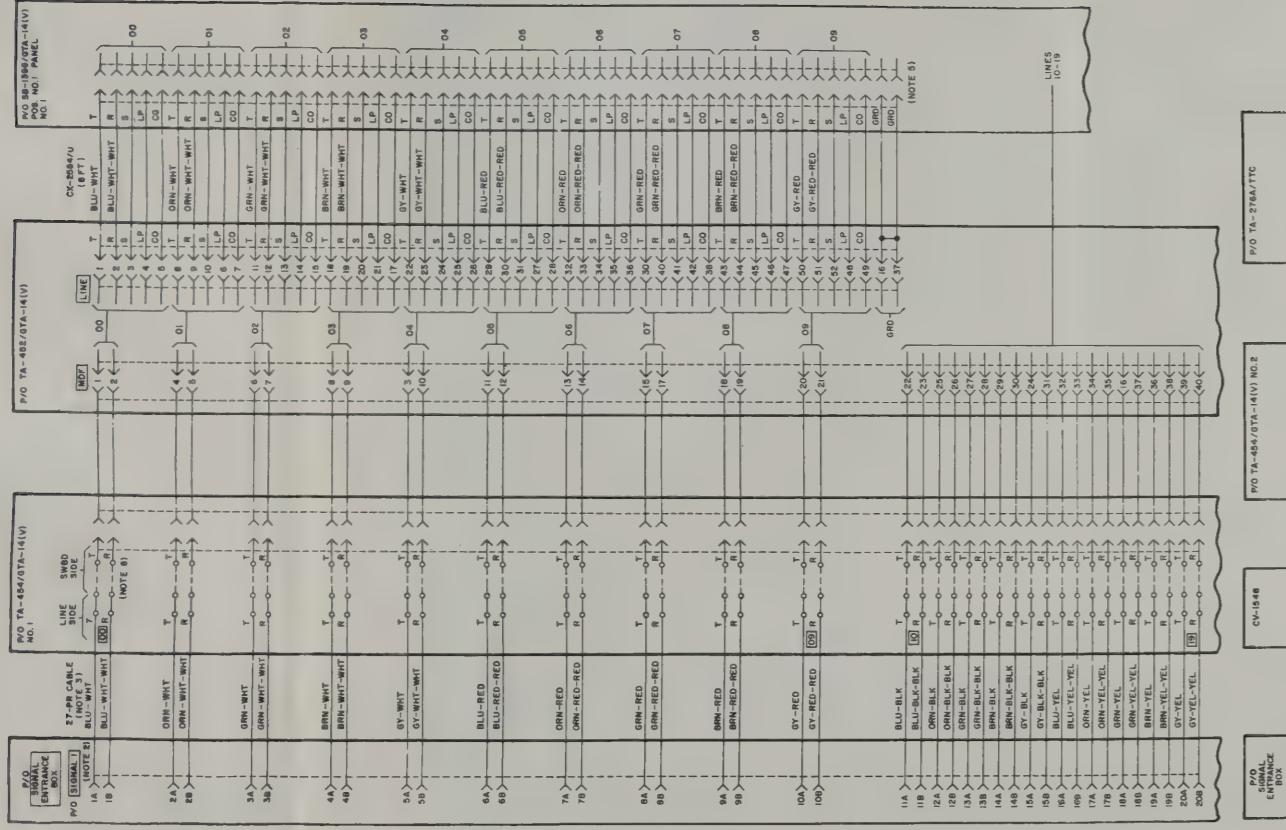
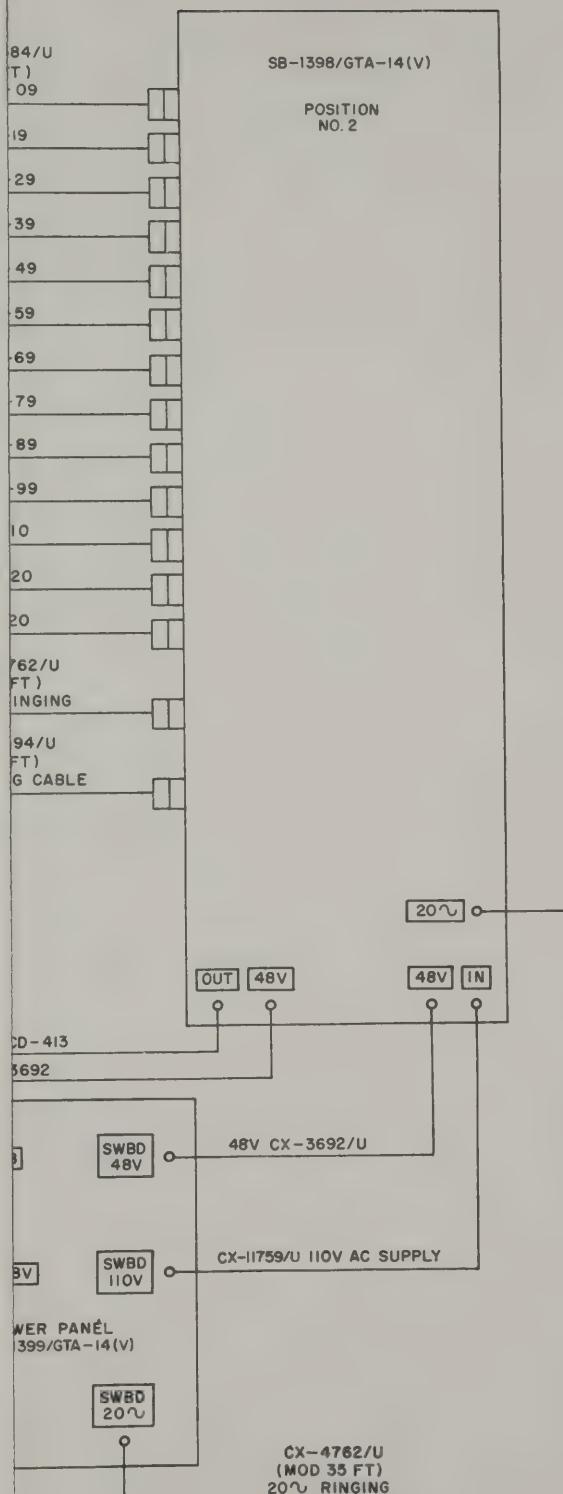


Figure 6-1. Signal circuits (schematic-wiring)

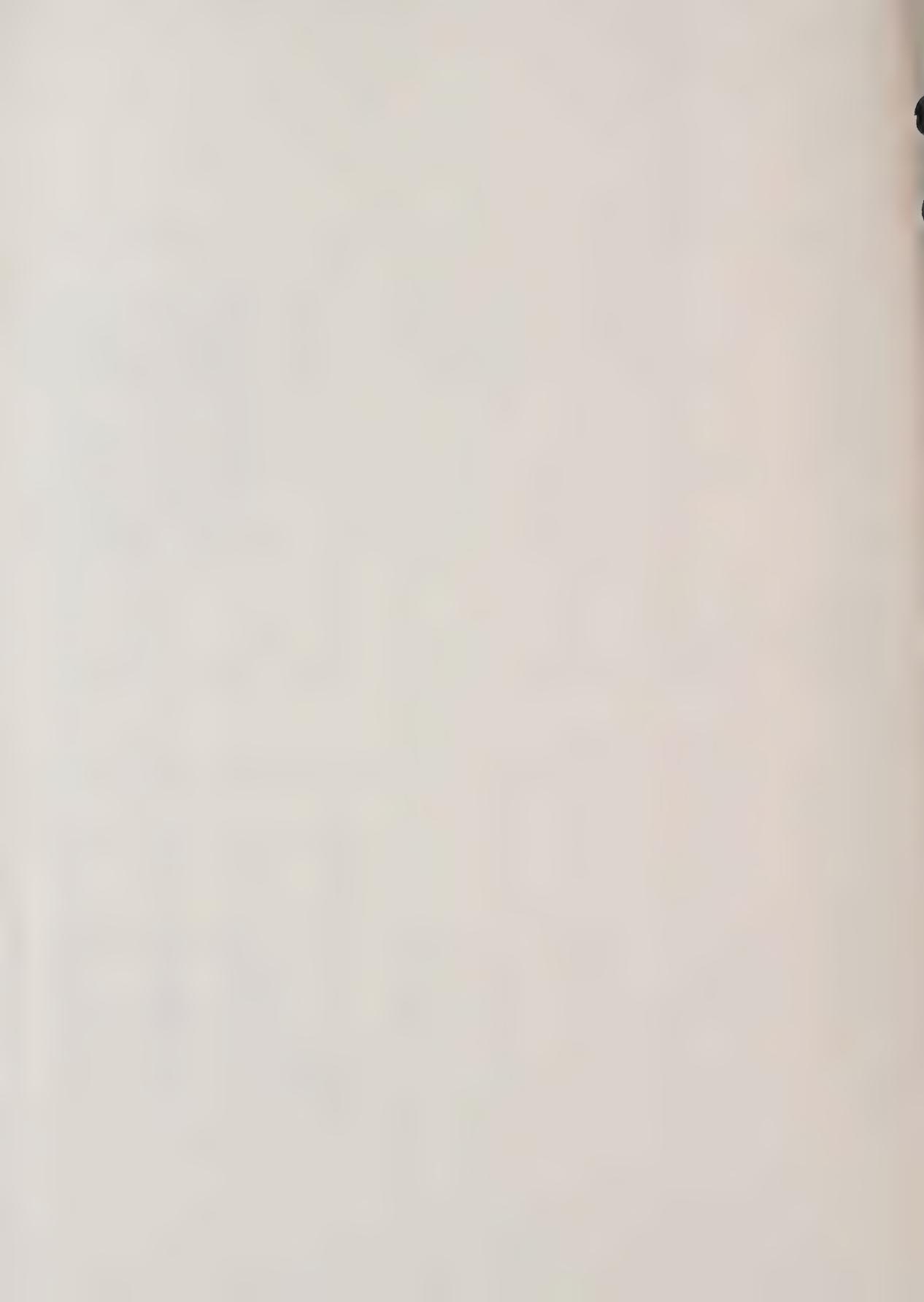




VALL

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Figure 6-2. AN/TTC-23 Switchboard Intercomponent Cabling Diagram.



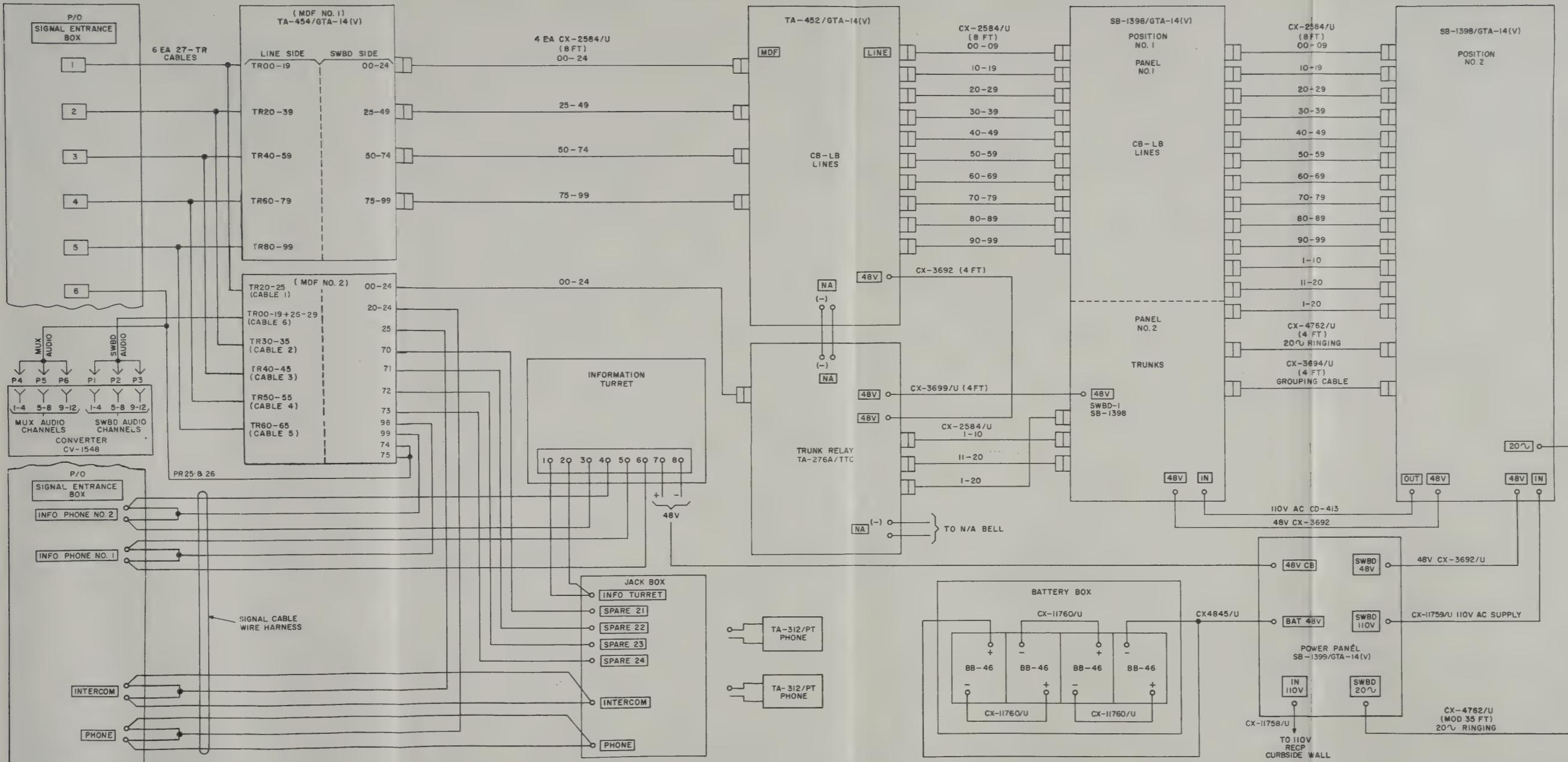
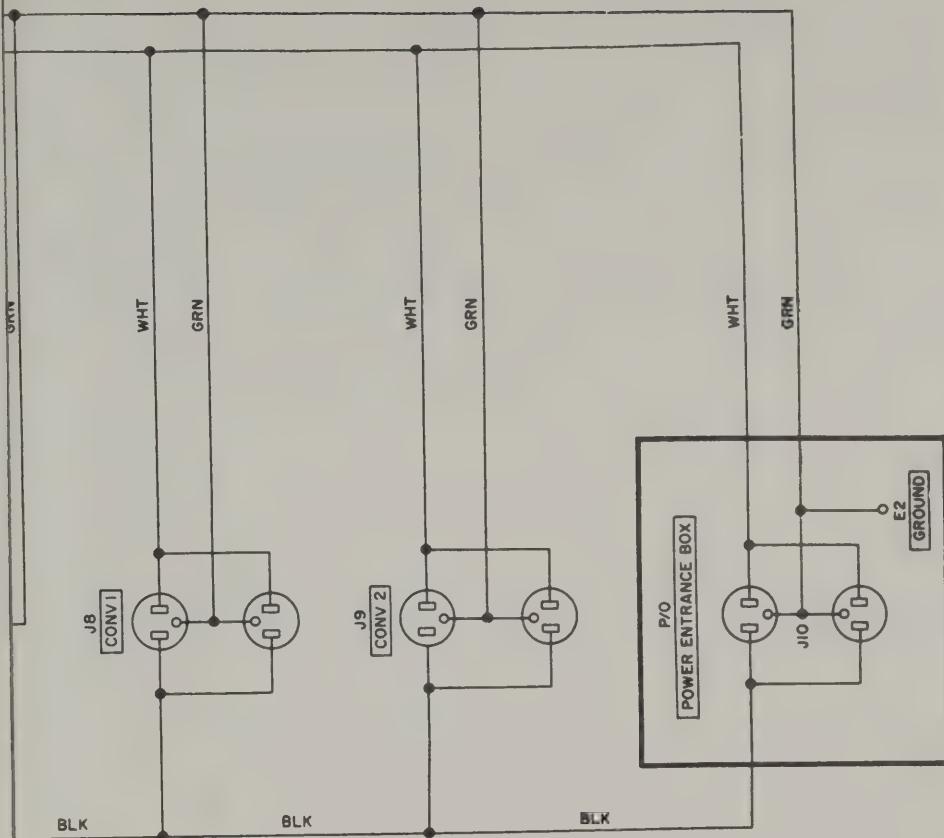


Figure 6-2. AN/TTC-23 Switchboard Intercomponent Cabling Diagram.



NOTES:

1. EMERGENCY LIGHTS RELAY AND FUSE, MOUNTED IN POWER DISTRIBUTION PANEL; 5 AMP CIRCUIT BREAKER LOCATED IN WIRE MOLD.
2. ALL WIRES ARE NO.12 AWG, UNLESS OTHERWISE SPECIFIED.
3. INDICATES EQUIPMENT MARKING.



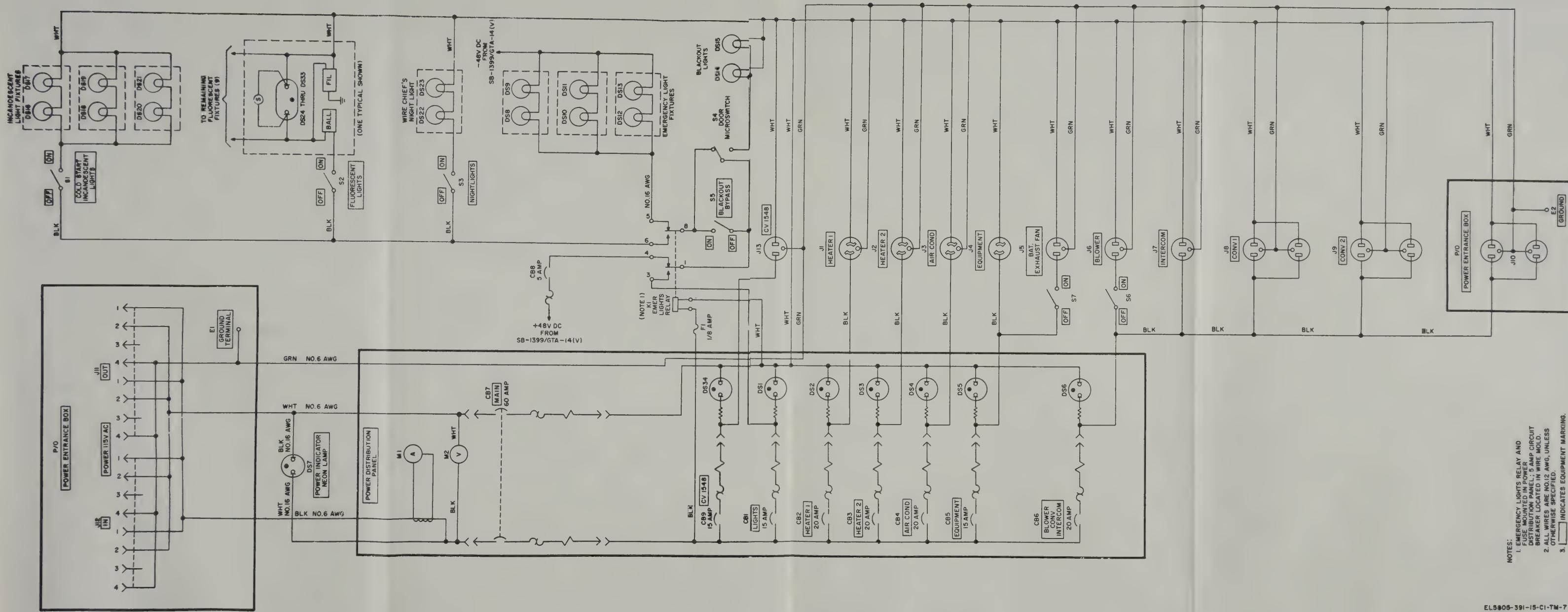
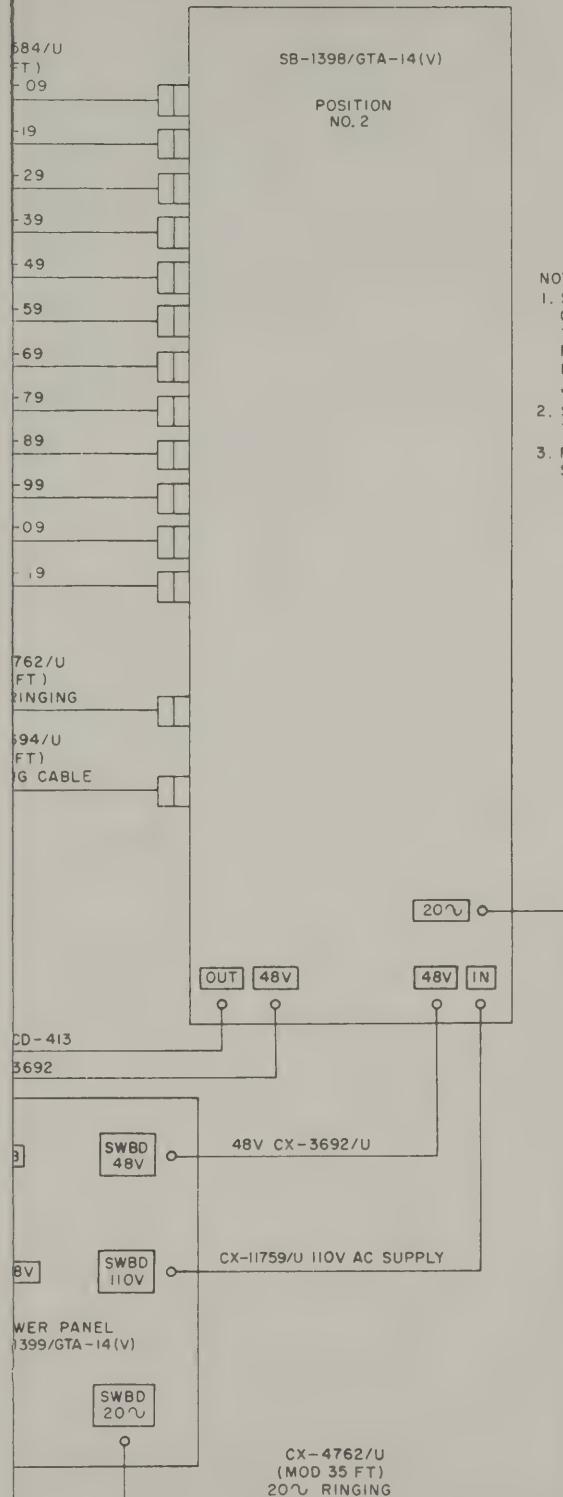


Figure 6-3. Power schematic-wiring diagram.



NOTES

1. SPARE LINE PAIR 21 OF SIGNAL CABLES #1 THRU #6 ARE JUMPED TOGETHER AT MDF #2 SPARE PAIRS 22 THRU 24, PHONE AND INTERCOM PAIRS 25 AND 26 ARE JUMPED IN THE SAME MANNER.
2. SWITCHBOARDS ARE MULTIPLIED TOGETHER.
3. FOR CIRCUIT DETAIL REFER TO SCHEMATIC WIRING DIAGRAM.

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Change 4



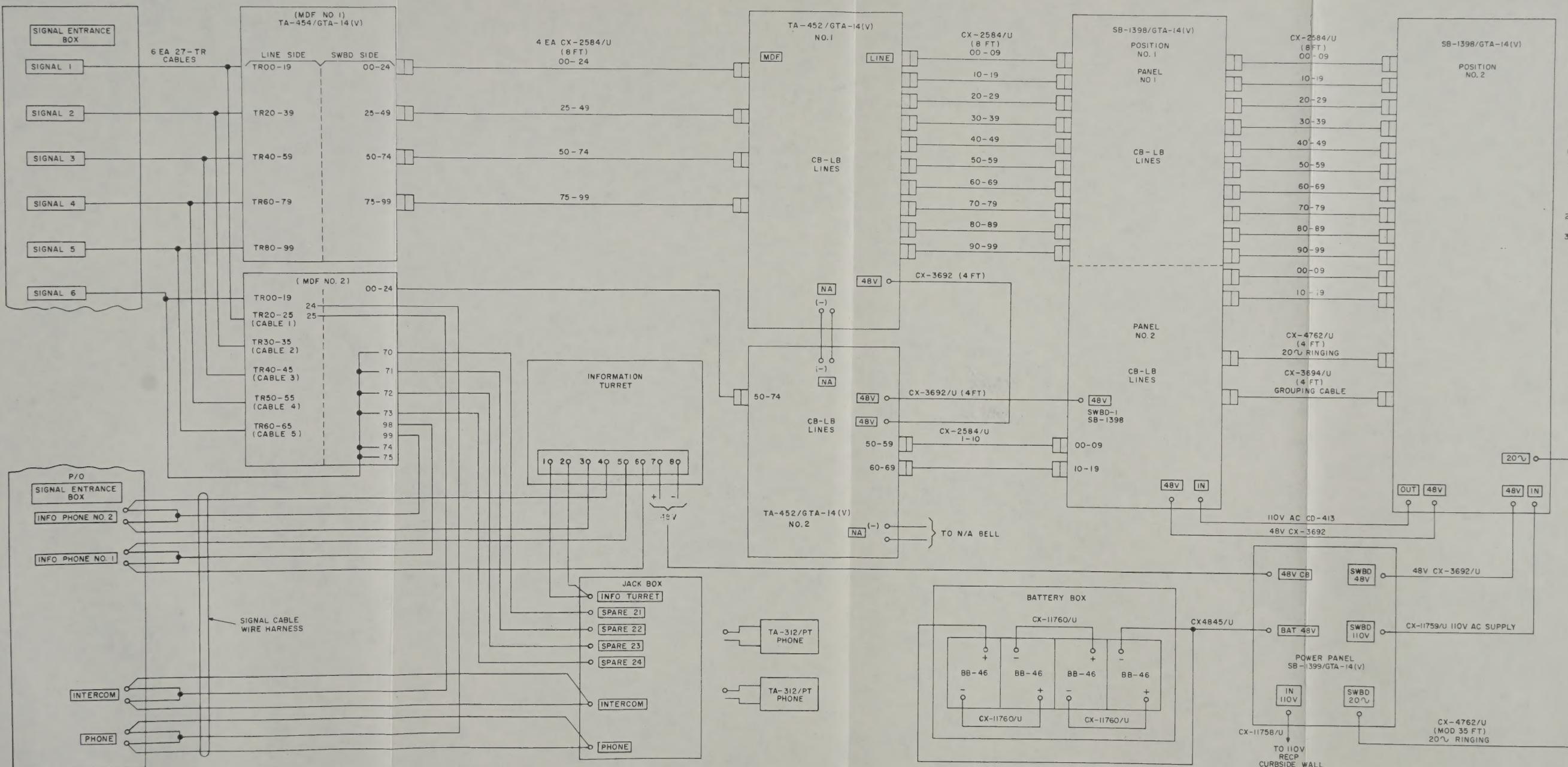


Figure 6-4. AN/TTC-23A Switchboard intercomponent cabling diagram.

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